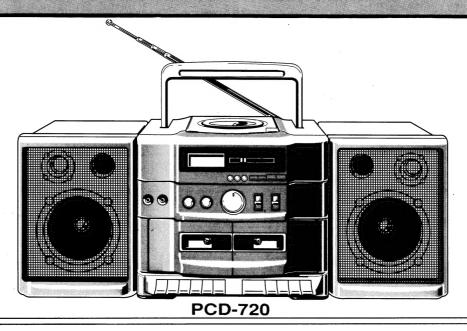


SERVICE MANUAL MODEL: PCD-720

RADIO CASSETTE RECORDER WITH COMPACT DISC PLAYER



SPECIFICATION

GENERAL

Frequency response : 20-20000Hz

Speakers : Woofer: \emptyset 100mm x 2 (4 Ω)

Tweeter: ø 27mm x 2

Maximum output : 4W/CH (RMS) at DC Power source : AC : See label rating

DC: 13.5V (D, RM1, HP2 x 9)

Power consumption : 18W

Dimension : W640 x D220 x H242.5

Weight : 5.3Kg (W/O batteries)

Headphone jack : Ø 3.5mm (stereo)

TAPE RECORDER

Track system : 4 track 2 channel
Recording system : AC bias (DECK A)
Erasing system : Magnetic erasing (DECK A)

Monitor system : Variable monitor
Frequency response : Normal 50 – 6300Hz

Tape speed : 4.75cm/sec (Normal speed) 9.5cm/sec (High speed)

Tape drive system : Capstan belt driven
Tape loading system : Front loading

Tape loading system : Front loading

Motor system : DC synchronous

2 speed motor (DC 12V)

Design and specifications are subject to change upon improvement without prior notice.

RADIO

Frequency range : FM: 88 – 108MHz

AM: 530 - 1705KHz(OPTION)

AM: 530 – 1605KHz SW: 6– 18MHz LW: 150 – 285KHz

I.F : FM : 10.7MHz

AM: 455KHz/465KHz(OPTION)

Antenna

FM (SW): Telescopic rod antenna

AM (LW): Ferrite bar antenna

COMPACT DISC PLAYER

Frequency range : 20-20,000Hz

Dynamic range : 83 dB (1KHz) with filter Signal to Noise ratio : 82 dB (1KHz) with filter

wow and flutter : 0.001% D/A conversion : 16 bit

CONTENTS

■ SAFETY PRECAUTION	2
■ SERVICING NOTE	3
■ LOCATION OF CONTROLS	4
■ DISASSEMBLY INSTRUCTION	6
■ DESCRIPTION OF LCD SEGMENT	8
■ TROUBLE SHOOTING CHART (RADIO CASSETTE)	9
■ ADJUSTMENT INSTRUCTIONS	14
■ CD ADJUSTMENT	20
■ BLOCK DIAGRAM	25
■ SCHEMATIC DIAGRAM	27
■ PCB PATTERN AND MARKING DIAGRAM	29
■ WIRING DIAGRAM	31
■ IC AND TR LEAD LAY OUT	33
■ EXPLODED VIEW	35
■ MECHANICAL PARTS	36
■ DECK EXPLODED VIEW	38
■ CASSETTE DECK PARTS LIST	38
■ CD DECK PARTS LIST	41
■ ELECTRICAL PARTS	42
■ TROUBLE SHOOTING (CD)	44
■ ABBREVIATION LIST	46

- OPTION -

UL/CSA : American (UL)/Canadian (CSA) model

AUS

: Australian model

FTZ

: Germany model

LW SW : LW band equipped unit

BS

.: UK model

SW band equipped unit

SAFETY PRECAUTION

1. CLASS1 LASER PRODUCT

This compact disc player is classified as a CLASS 1 laser product.

2. LASER WARNING LABEL

The label shown below may be affixed or not according to country.

(EU) (CSA) (UL) CERTIFIED ONLY TO CANADIAN This Product Compiles with CLASS 1 DHHS Rules 21CFR, Sub ELECTRICAL CODE. chapter J.At date of Manu-LASER PRODUCT CERTIFIE EN VERTU DU CODE facture. CANADIAN DE LELETRICITE **SEULEMENT**

Location: Enclosure back.

(SCAN)

ADVARSEL: USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

(EU)

UL Manufactured for U.S.A. Market. CSA Manufactured for Canadian Market. ΕU Manufactured for European Market Manufactured for Scandinavian Market. SCAN

Location : on the disc clamper or inner side of CD door or nearby CD chassis.

3. LASER BEAM WARNING

ADVERSEL - USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSAETTELSE FOR STRÅLING.

OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRR ÄR URKOPPLAD. STRALEN VARNING -

ÄR FARLIG.

LAITE SISÄLTÄA LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTA SILMILLE VAARALLISTA **VARITUS** —

LASERSATEILYÄ.

INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO CAUTION -

BEAM.

4. LASER DIODE SPECIFICATION (OPTICAL PICK-UP)

Material: AlGaAs

Wavelength: 760-800mm Emission duration: Continuous

Laser Output: 0.2mW

* This output is the value measured at distance 1.6mm from the objective lens surface on the optical pick-up block.

Classification: CLASS 1

5. WARNING FOR SERVICING

When servicing, do not approach the LASER exit with the eye too closely. In case it is necessary to confirm **WARNING:**

LASER beam emission, be sure to observe from a distance of more than 30cm from the surface of the

objective lens on the optical pick-up block.

När underhållningsarbeten utförs, närma dig försiktigt och se inte på laserutstrålningen på för näre häll. Ifall det **VARNING:**

är nödvändigt att betrygga laserstrålens utströmning. Var säker att kontrollera detta från ett avstånd av mer än

30cm (11.81 inch.) från den objektiva linsens yta på den optiska utsåndningspunkten.

När repareringsarbeidet udfoeres, naerm dig forsigtigt og se ikke på laserudstrålingen på for naer hånd. ADVARSEL:

It ilfaeldet at det er noedvaendigt at bestemme laserstrålens udstråling. Vaer sikker på kontrollere dette fra en afstand af mere end 30cm (11.81 inch.) fra den objektive linses overflade på den optiske udsendningspunkt.

Silmiä on varottava viemästä liian läbeiie Laser-poistokanavaa huoiion aikana. Jos on välttämätöntä varmistaa

VAROITUS:

Laser-Säteen päästö, pysyttels sitä tarkasteltaessa vähintään 30cm etäiyydellä optisen lukon objecktiivilinssin

pinnasta.

SERVICING NOTE

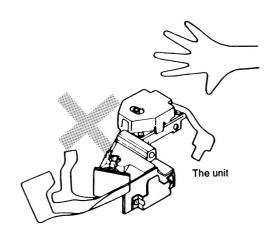
- 1. Disconnect power supply cord before separating cabinet for servicing as you may experience an electric shock.
- 2. Avoid repairing under direct sunshine and heat which may cause cabinet, transistor and IC to be transformed or misoperate.
- 3. Use a soft cotton swab moistened with warm water or neutral cleaner when parts of a unit need to be cleaned.
- 4. When replacing parts with safety features built in, be sure to use specified parts with same specifications only.
- 5. Avoid repairing the set near a TV or any other magnetic forces.
- 6. Disconnect the plug from wall socket during electric storm to reduce the risk of damage.
- 7. Be careful of electrostatic damage when replacing the control IC such as μ-COM, LSI and pick-up.

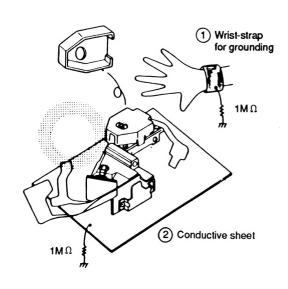
HANDLING THE OPTICAL PICK-UP

* The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

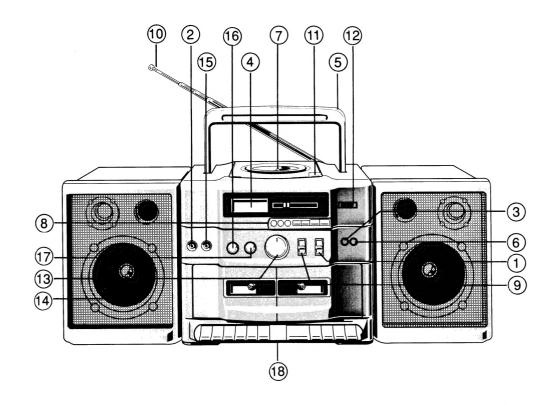
- 1. Place a conductive sheet on the workbench. (The black sheet used as wrapping for repair parts.)
- 2. Place the set on the conductive sheet so that the chassis is grounded to the sheet.
- 3. Place your hands on the conductive sheet. (This gives them the same ground as the sheet.)
- 4. Remove the optical pick up block.
- Perform work on top of the conductive sheet.
 Be careful not to let your clothes or any other static sources touch the unit.
- * Be sure to put on a wrist-strap grounded to the sheet.
- Be sure to lay a conductive sheet made of copper etc. which is grounded to the table.



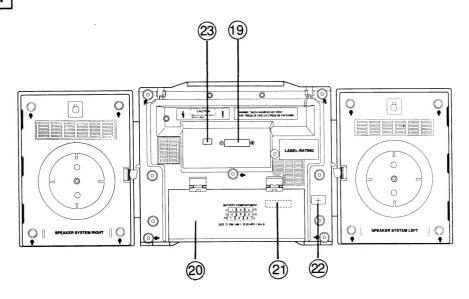


■ LOCATION OF CONTROLS

FRONT panel



REAR panel



<Front Panel>

- 1. BAND Selector
- 2. PHONES jack
- 3. POWER indicator
- 4. CD operation LCD
- 5. Handle
- 6. FM-ST indicator
- 7. CD door
- 8. CD operation buttons
 BACK/REW button
 NEXT/FF button
 PROG button
 DISPLAY button
 MODE button
 STOP button
- PLAY/PAUSE button
 9. DUBB/FUNCTION selector
- 10. Rod antenna
- 11. PUSH OPEN button (CD)
- 12. TUNING knob
- 13. VOLUME control
- 14. Speaker
- 15. BALANCE control

- 16. BASS control
- 17. TREBLE control
- 18. Deck control button RECODE button (DECK A only) PLAY button REW button F.FWD button STOP/EJECT button

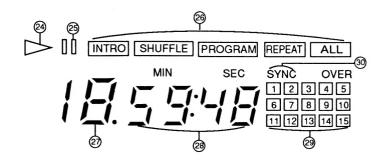
<Rear Panel>

PAUSE button

- 19. Speaker Terminal
- 20. Battery compartment
- 21. Voltage selector (optional)
- 22. AC IN ~ socket
- 23. MODE/BEAT CUT selector

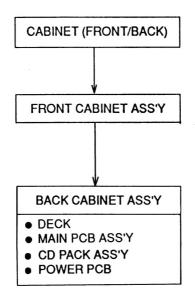
<CD Operation LCD>

- 24. Play indicator
- 25. Pause indicator
- 26. INTRO, SHUFFLE, PROGRAM, REPEAT, ALL indicators
- 27. Track number indicator
- 28. Time indicator
- 29. Track number display (CD CALENDAR)
- 30. SYNCHRO RECORDING indicator

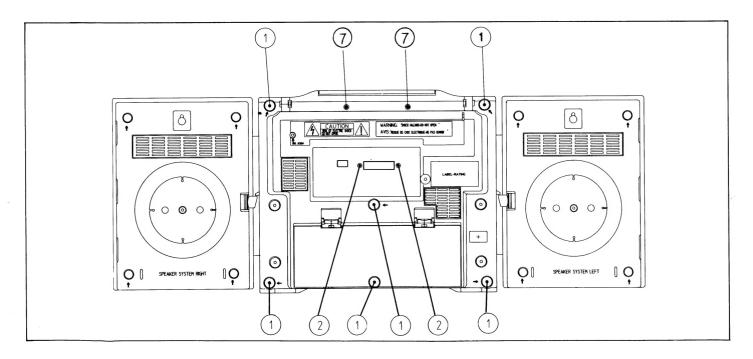


DISASSEMBLY INSTRUCTION

PROCEDURE OUTLINE



1. FRONT & BACK CABINET



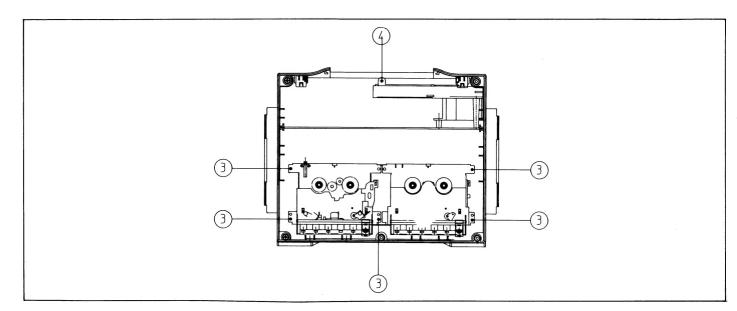
- 1) Remove the 6screws (1)
- 2) Separate Front & Back cabinet.

2. MAIN PCB ASSY

- Remove the 1 screw (4) and 2 screws (2) (page 6).
 disconnect connecting wires LEAD FASTEN, UCW901, RCW701 and take out.

3. DECK

- 1) Remove the 5 screws (3).
- 2) disconnect connecting wires (CCW801, JCW301, KCW401) and take out.
- 3) Remove deck from the BACK cabinet.

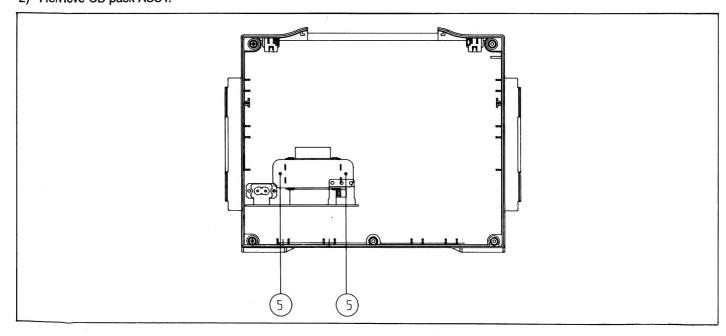


4. POWER PCB

- 1) Remove the 2 screws (5)
- 2) Remove power PCB from the back cabinet.

5. CD PACK ASSY

- 1) Remove the 2 screws ⑦.
- 2) Remove CD pack ASSY.

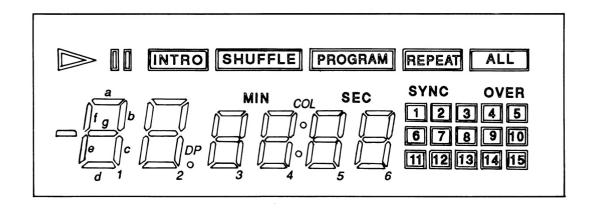


■ DESCRIPTION OF LCD SEGMENTS

If one or all of the LCD Segments (see segment diagram below) don't work, check if IC7530 and LCD pins are properly connected refering to the chart below.

No	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COM1	сом			INTRO		1a		SHUFFLE	2a	DP	PROGRAM	3a	MIN	REPEAT
СОМ2		сом		>	1f	1g	1b	2f	2g	2b	3f	3g	3b	4f
сомз			СОМ	••	1e	1d	1c	2e	2d	2c	Зе	3d	Зс	4e

No	15	16	17	18	19	20	21	22	23	24	25	26	27	28
COM1	4a	COL	ALL	5a	SEC	SYNC	6a	OVER	1	2	3	4	5	
COM2	4g	4b	5f	5g	5b	6f	6g	6b	6	7	8	9	10	
сомз	4d	4c	5e	5d	5c	6e	6d	6c	11	12	13	14	15	



■ TROUBLESHOOTING CHART (RADIO CASSETTE)

2. BATTERY POWER INSENSIBLE 1. AC POWER INSENSIBLE Install battery Properly **Check Proper Polarity** Replace AC Cord **Check AC Cord Connection** 0 Check setting of voltage 0 selector Switch 0 Unplug Replace Fuse Check if AC cord is plugged in Check RF701Fuse cut Ó Check Voltage of RCON702 0 (Power PCB) Replace Power Trans Check voltage of RCON701 X 0 (Power PCB)

1. Check if Battery Spring Wire is cut.

3. Check proper polarity positioning.

2. Check battery contacts.

Check connection of RCW701

and soldering

& Soldering

Check for LED defect

Note : O denotes YES, NORMAL or OK X denotes NO, Abnormal

Χ

0

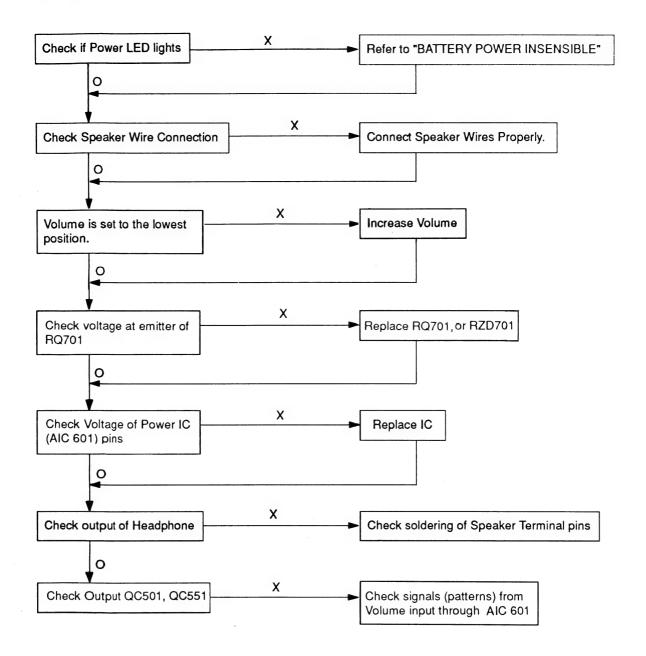
Check if LED lights

(Main PCB)

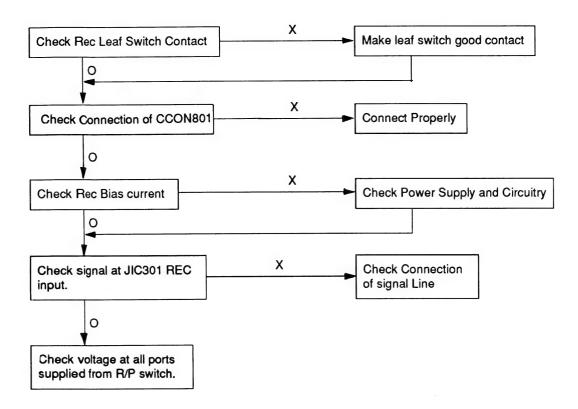
(Radio)

Check Voltage of RCW701

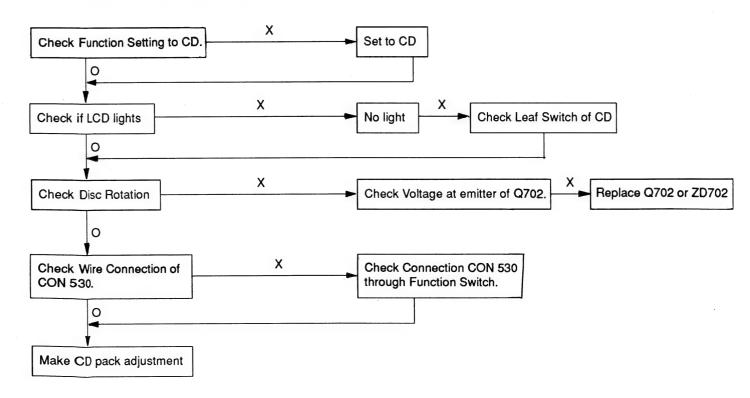
3. NO OUTPUT



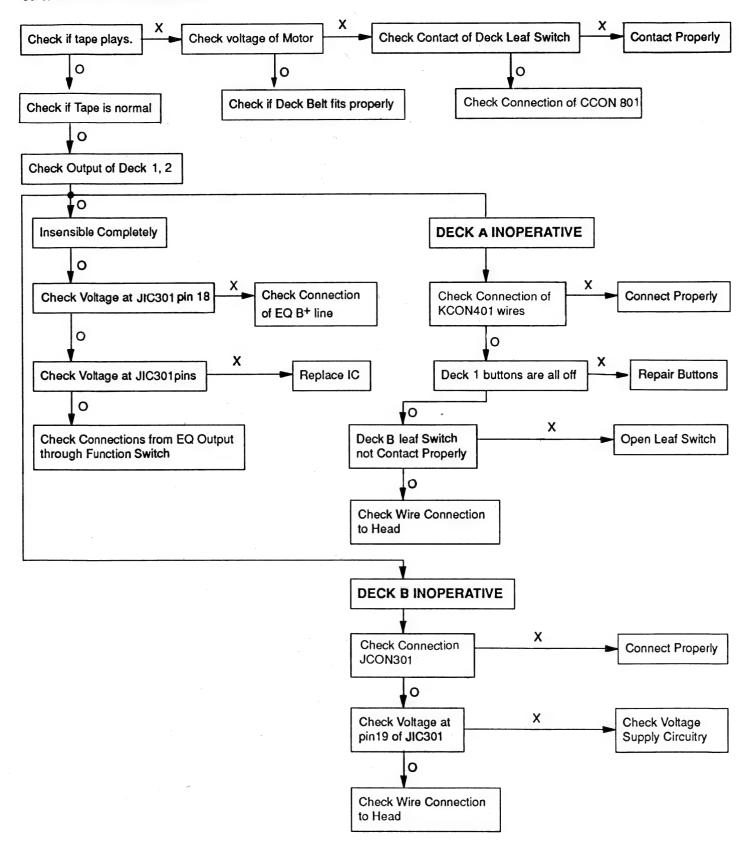
4) RECORDING NOT WORKING



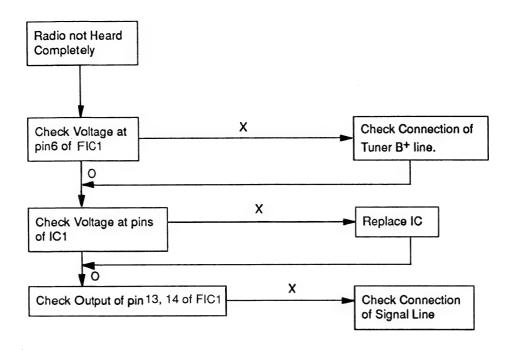
5) COMPACT DISC INOPERATIVE

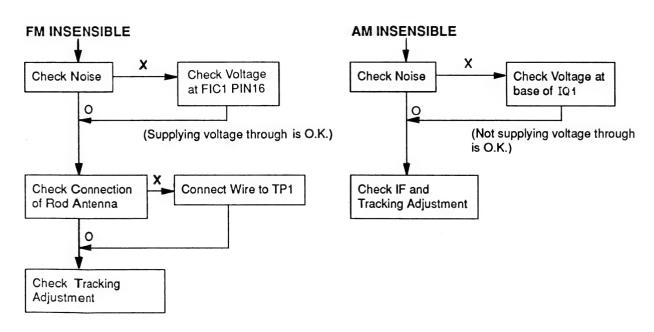


6. TAPE NOT WORKING



7. RADIO INSENSIBLE





ADJUSTMENT INSTRUCTION

ADJUSTMENT PROCEDURE

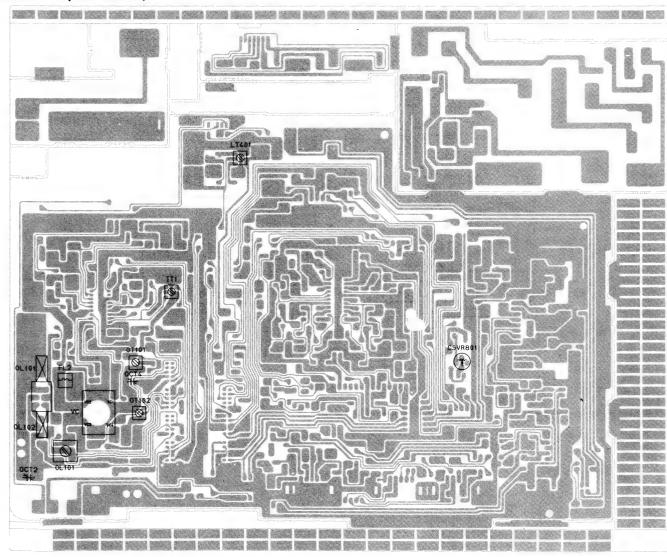
INSTRUMENTS AND TOOLS

- 1. AM STANDARD SIGNAL GENERATOR
- 2. FM STANDARD SIGNAL GENERATOR
- 3. FM/AM IF GENERATOR: 10.7MHZ, 455KHZ (465KHZ)
- 4. OSCILLOSCOPE
- 5. OUTPUT METER: LEVEL METER OR AC VOLTMETER.
- 6. LOOP ANTENNA
- 7. DUMMY LOAD (4 ohm)
- 8. SW DUMMY ANT.
- 9. FREQUENCY COUNTER
- 10. FM STEREO MODULATOR

IMPORTANT

- 1. Check the power source voltage.
- 2. Select desired Band and Function.
- 3. Set Tone Control at mid position.
- 4. Modulate AM to 30% amplitude with 400Hz signal and FM to 22.5MHz deviation with 400Hz signal.
- 5. Set volume Control to approximately 50mW (4 ohm)

LOCATION OF ADJUSTMENT POINT (AUDIO SECTION) MAIN PCB (PARTS SIDE)



ADJUSTMENT

1. FM ADJUSTMENT

ITEM	CONNECTION	STEP	S.S.G Frequency	RADIO DIAL SETTING	Adjustment Point	REMARK		
Fraguancy		1	87.3MHz	Tune to the Lowest frequency	FL2 FM OSC coil	Best resonating point of SSG.		
Frequency coverage	Fig. 2	2	108.3MHz	Tune to the highest frequency	VC1 OSC trimmer (VARICON)	Best resonating point of SSG.		
		3	Repeat steps 3 and 4 several times.					
		4	90MHz	90MHz	Not required			
Tracking	Fig. 2	5	106MHz	106MHz	VCT2 ANT trimmer (VARICON)	Maximum Output		
		6	Repeat steps 6 and 7 to obtain suitable sensitivity at 90MHz and 106MHz.					

FM OUTPUT: FIC1 (KA2293) PIN NO. 13, 14

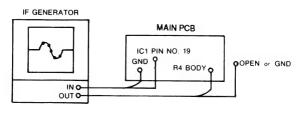


Fig. 1

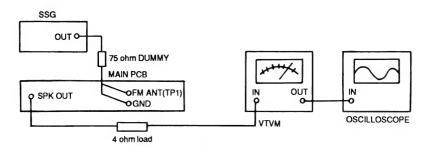
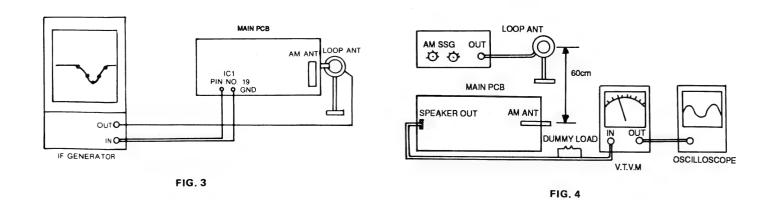


Fig. 2

2. 2 BAND (FM/AM) AM ADJUSTMENT

ITEM	CONNECTION	STEP	S.S.G Frequency	RADIO DIAL SETTING	Adjustment Point	REMARK		
IF	Connect FM/AM IF generator to loop ANT Couple the AM ANT coil close to loop ANT and take out the signal from	1	455KHz (465KHz)	Lowest frequency	AM IFT IT1 (WHT)	Maximum output and best "V" curve		
	AM IF out point (IC1 pin No 19) (See Fig. 3)	2	Repeat 1 unti	l no futher can be made.				
AM		3	515KHz	Lowest frequency	AM OSC coil (RED) OT101	Best resonating point of SSG		
coverage	Fig. 4	4	1680KHz	highest frequency	AM OSC trimmer VC3 (VARICON)	Best resonating point of SSG		
		5	Repeat steps 3 and 4 several times					
AM		6	600KHz	600KHz	AM ANT coil OL101	Maximum output		
tracking	Fig. 4	7	1400ĶHz	1400KHz	AM ANT trimmer (VCT4) (VARICON)	Maximum output		
		8	Repeat steps 6 and 7 to obtain suitable sensitivity at 600KHz and 1400KHz.					

AM IF OUTPUT: FIC1 (KA2293) PIN NO. 19.



3. 3 BAND (FM/SW/AM) AM/SW ADJUSTMENTS

ITEM	CONNECTION	STEP	S.S.G Frequency	RADIO DIAL SETTING	Adjustment Point	REMARK
IF	IF is the same as 2 band's					
		1	515KHz	Lowest frequency	AM OSC coil (red) OT101	Best resonating point of SSG
AM coverage	Fig. 4	2	1680KHz	highest frequency	AM OSC trimmer OCT4	Best resonating point of SSG.
		3	Repeat steps	1 and 2 several times	3	
AM tracking		4	600KHz	600KHz	AM ANT COIL OL102	Maximum output
	Fig. 4	5	1400KHz	1400KHz	AM ANT trimmer VC4 (VARICON)	Maximum output
		6	Repeat steps 4 and 5 to obtain suitable sensitivity at 600KHz and 1400KHz.			
SW frequency coverage	Connect AM(SW) signal generator to SW ANT terminal (TP1) thru SW	7	5.7MHz	Lowest frequency	SW OSC COIL OT102	Best resonating point of SSG
	dummy ANT and speaker output to VTVM across 4 ohm load. (see Fig, 5 Fig. 6)	8	18.5MHz	highest frequency	SW OSC trimmer VC3 (VARICON)	Best resonating point of SSG.
		9	Repeat steps	7 and 8 several time	s	
sw		10	7MHz	7MHz	SW ANT coil OL101	Maximum output
tracking	Fig. 5, Fig. 6	11	15MHz	15MHz	NO ADJUSTMENTS	
12 Repeat steps 10 and 11 to obtain suitable sensitivity at 7MHz and 15MHz.					suitable	,

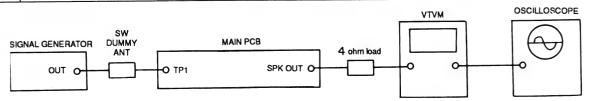


FIG. 5 SW FREQUENCY COVERAGE, TRACKING ADJUSTMENT

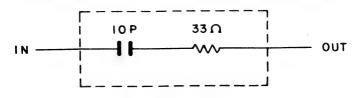


FIG. 6 SW DUMMY ANT

4. 3 BAND (FM/MW/LW) MW(AM)/LW ADJUSTMENTS

ITEM	CONNECTION	STEP	S.S.G Frequency	RADIO DIAL SETTING	Adjustment Point	REMARK
IF	IF is the same as 2 band's					
MW(AM)		1	515KHz	lowest frequency	MW OSC coil OT102 (red)	Best resonating point of SSG
frequency coverage	Fig. 4	2	1680KHz	highest frequency	MW OSC trimmer VC3 (VARICON)	Best resonating point of SSG.
		3	Repeat steps	1 and 2 several times	3	
MW(AM) tracking		4	600KHz	600KHz	MW ANT coil OL101	Maximum output
	Same as 2 band's (see Fig. 4)	5	1400KHz	1400KHz	MW ANT trimmer VCT4 (VARICON)	Maximum output
		6	Repeat steps 4 and 5 to obtain suitable sensitivity at 600KHz and 1400KHz.			
LW		7	145KHz	lowest frequency	LW OSC coil OT101	Best resonating point of SSG
frequency coverage	Fig. 4	8	295KHz	highest frequency	LW OSC trimmer OCT4	Best resonating point of SSG.
		9	Repeat steps	7 and 8 several times	3	
LW		10	170KHz	170KHz	LW ANT coil OL102	Maximum output
tracking	Fig. 4	11	250KHz	250KHz	LW ANT trimmer OCT2	Maximum output
		12		10 and 11 to obtain su 70KHz and 250KHz.	itable	

5. TAPE SECTION

1. RECORDING BIAS ADJUSTMENT

- (a) Connect frequency counter to LC403 (See Fig 7) and press the Record button.
- (b) Adjust LT401 (BIAS OSC COIL) until frequency counterreads 50KHz on stereo FM mode.

2. TAPE AZIMUTH ADJUSTMENT

- a) Connect the equipments as per Fig. 8 to adjust the tape azimuth with test tape (recorded at 8KHz MTT-113CN).
- b) Play the test tape after inserting in DECK A.
- c) Adjust the azimuth ajustment screw of left side of record/play head for maximum output and for the same channel phase. (see Fig. 9)
- d) Repeat steps a c at DECK B position.
- e) After adjustment, be sure to lock the adjusting screws.

3. TAPE SPEED ADJUSTMENT

- a) Connect the equipments as Fig. 8 to adjust the tape speed with test tape [recorded at 3KHz, MTT-111N].
- b) Normal speed
 - 1) Set function Selector to "NORMAL" and press PLAY.
 - 2) Adjust the semi-fixed resistor (CSVR801) so that the frequency counter reads 3KHz
- c) High speed
 - 1) Insert a test tape into DECK B and set the FUNCTION selector to "HIGH" position.
 - Press Record (deck A) and PLAY (deck B).
 Then the speed of "HIGH" position is fixed approximately 5400Hz-6600Hz.

PRE/REC PCB

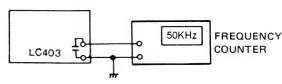
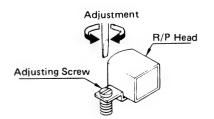


FIG. 7 RECORDING BIAS ADJUSTMENT



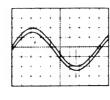


FIG. 9 AZIMUTH ADJUSTMENT

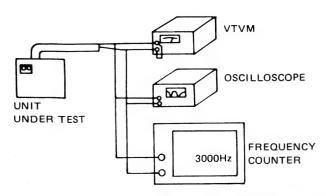
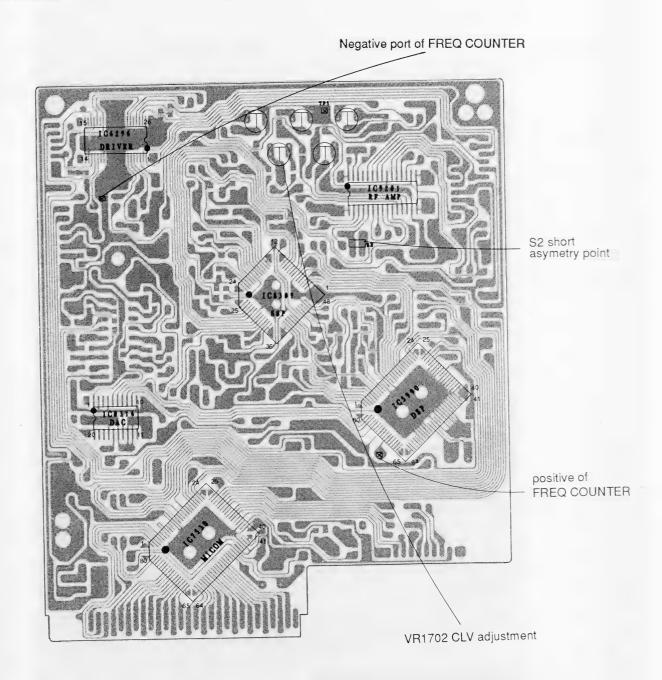


FIG. 8 AZIMUTH. SPEED ADJUSTMENT

CD SECTION

1) CLV ADJUSTMENT

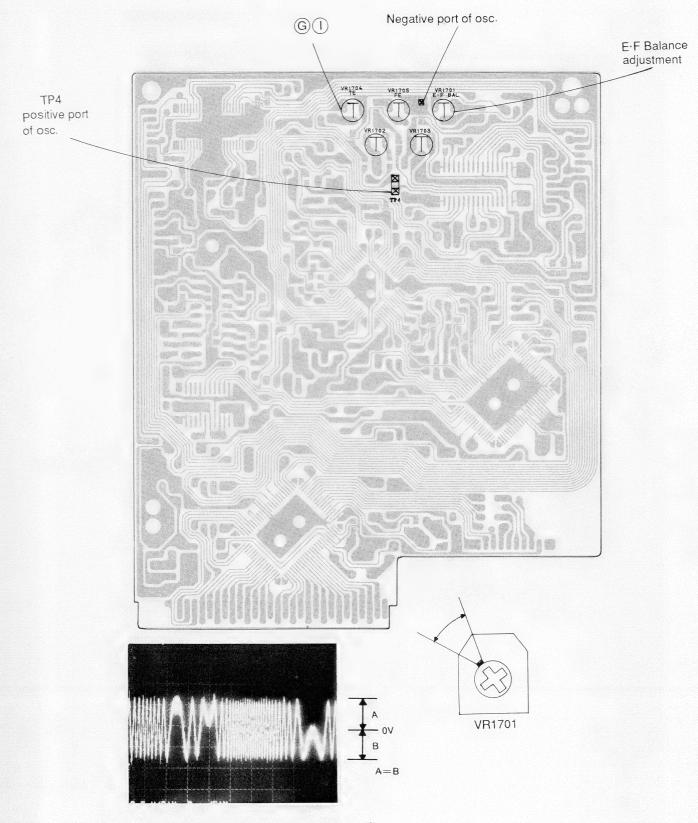
- 10 : 1 damping probe.A. Turn power on without loading a disc.
- B. Connect S2 (Asymetry; short)
- C. Connect TP5 to GND and TP2 to positive terminal on the Frequency Counter.
- D. Adjust VR 1702 so that the Frequency Counter reads 4.28MHz ± (0.01MHz)
- E. Disconnect S2.





2) EF BALANCE ADJUSTMENT (Power On)

- A. Set Oscilloscope Time/Div to 2mS.
- B. Set Oscilloscope Volt/Div to 0.5V.
- C. Connect TP1 (Vref) to GND and TP4 (T.E) to positive terminal on the oscilloscope.
- D. Press PLAY with loading a disc.
- E. Adjust VR1704 all the way counter clockwise. (Intermittent Sound)
- F. Adjust VR1701 so that the waveform is equally symmetrical above and below (A = B) the Center.
- G. Adjust VR1704 so that Sound comes out normally (Nearly mid-position of VR1704).

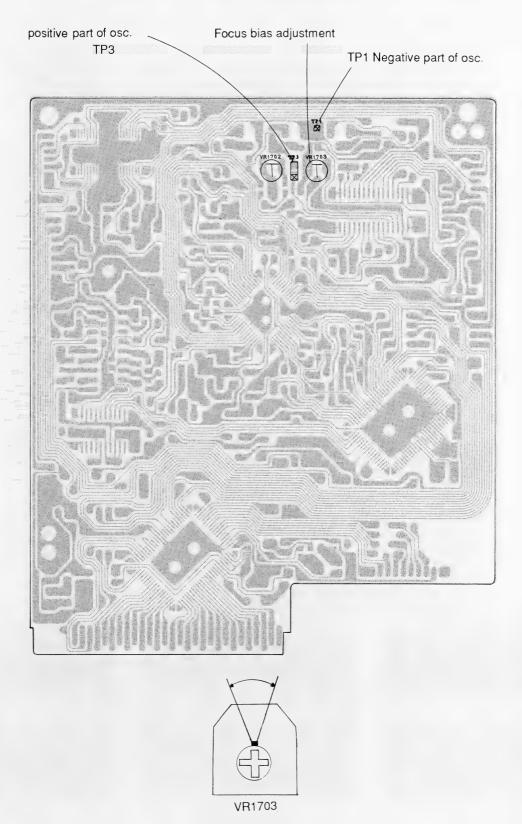


3) FOCUS BIAS ADJUSTMENT

- A. Turn power on without loading a disc.

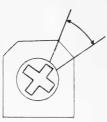
 B. Set Oscilloscope Vol/Div to DC200mV.

 C. Connect TP1 (Vref) to GND and TP3 (F.E) to positive terminal on the oscilloscope.
- D. Adjust VR1703 so that the voltage is 0 mV DC on the oscilloscope.



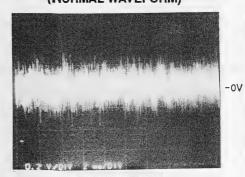
4) TRACKING GAIN ADJUSTMENT (Power On)

- A. Connect TP1 (Vref) to GND and TP6 (T.E) to positive terminal on the oscilloscope.
- B. Press PLAY with loading a disc.
- C. Adjust VR 1704 so that Waveform is as shown in the figure below.



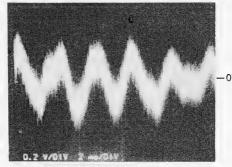
VR1704 TP4 positive port of osc. Tracking gain adjustment TP1 Negative port of osc

(NORMAL WAVEFORM)



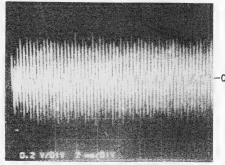
VOLT/DIV: 0.2V TIME/DIV: 2mS

(LOW TRACKING GAIN)



VOLT/DIV: 0.2V TIME/DIV: 2mS — 23 —

(HIGH TRACKING GAIN)



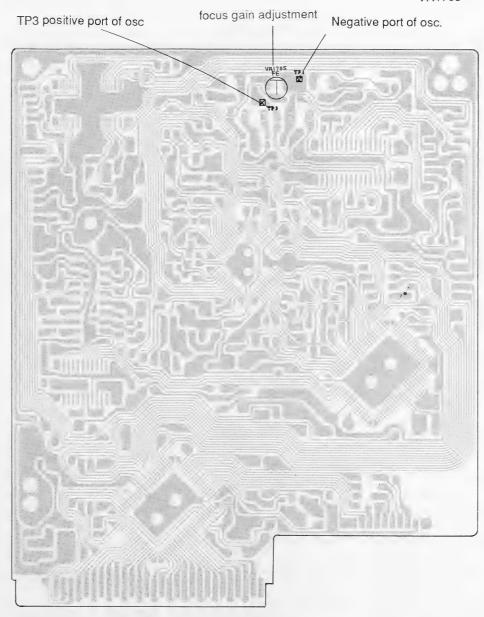
VOLT/DIV: 0.2V TIME/DIV: 2mS

5) FOCUS GAIN ADJUSTMENT (Power ON)

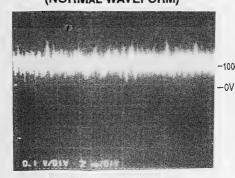
- A. Connect TP1 (Vref) to GND and TP7(F.E)to positive terminal on the oscilloscope.
- B. Press PLAY with loading a disc.
- C. Adjust VR 1705 so that the waveform is as shown in the figure below.



VR1705

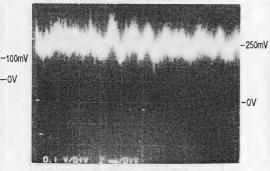


(NORMAL WAVEFORM)



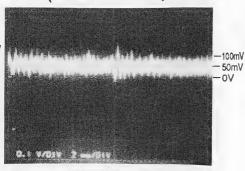
VOLT/DIV: 0.1V TIME/DIV: 2mS

(LOW FOCUS GAIN)



VOLT/DIV: 0.1V TIME/DIV: 2mS — 24 —

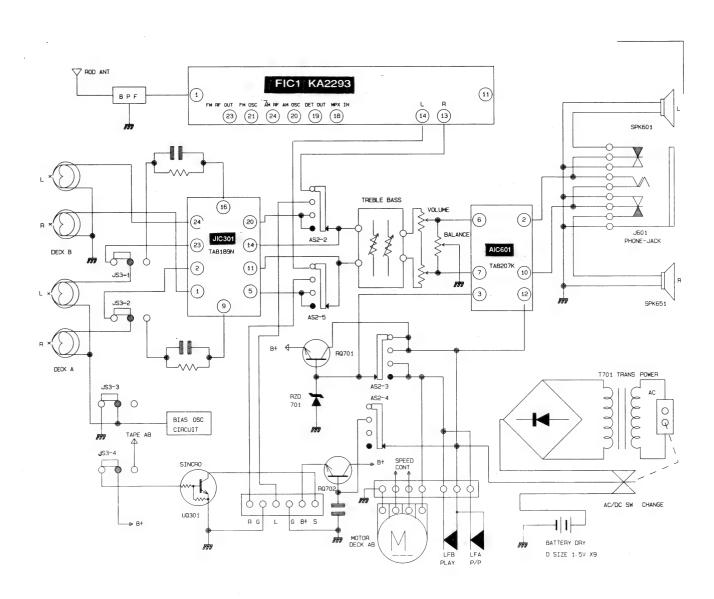
(HIGH FOCUS GAIN)



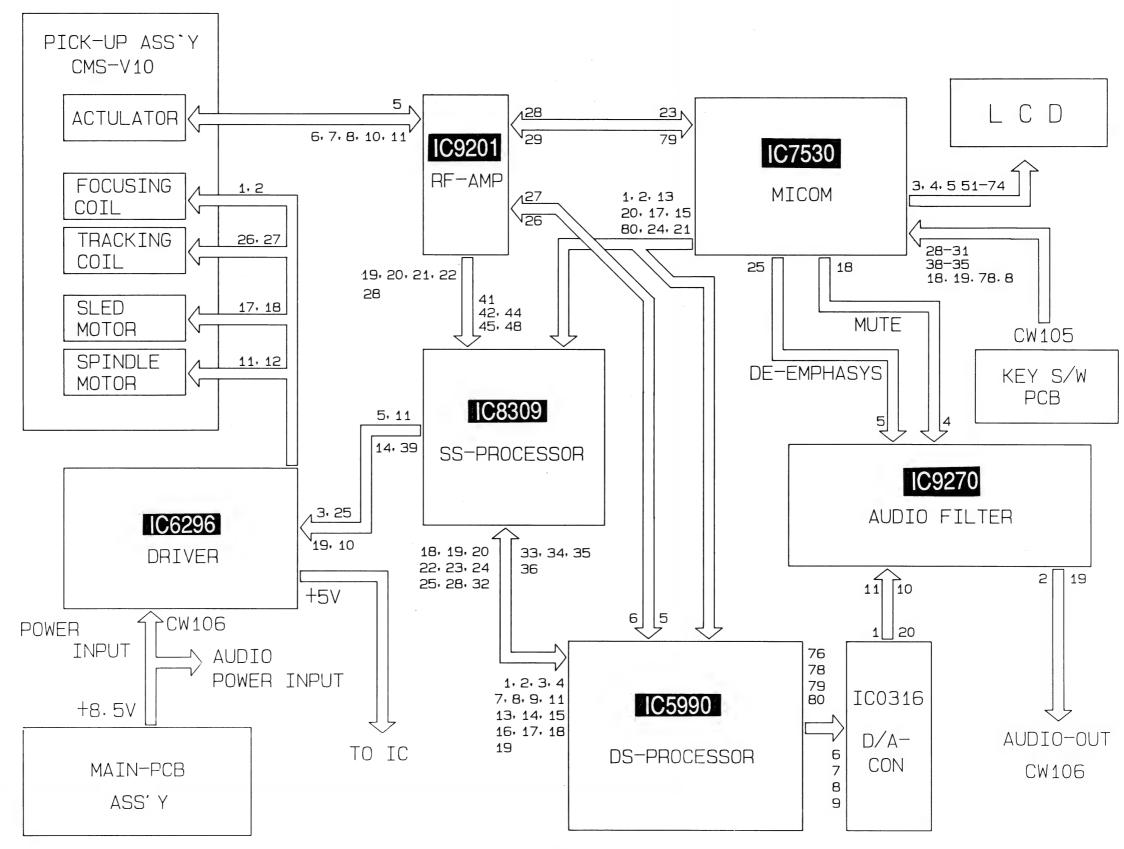
VOLT/DIV: 0.1V TIME/DIV: 2mS

BLOCK DIAGRAM

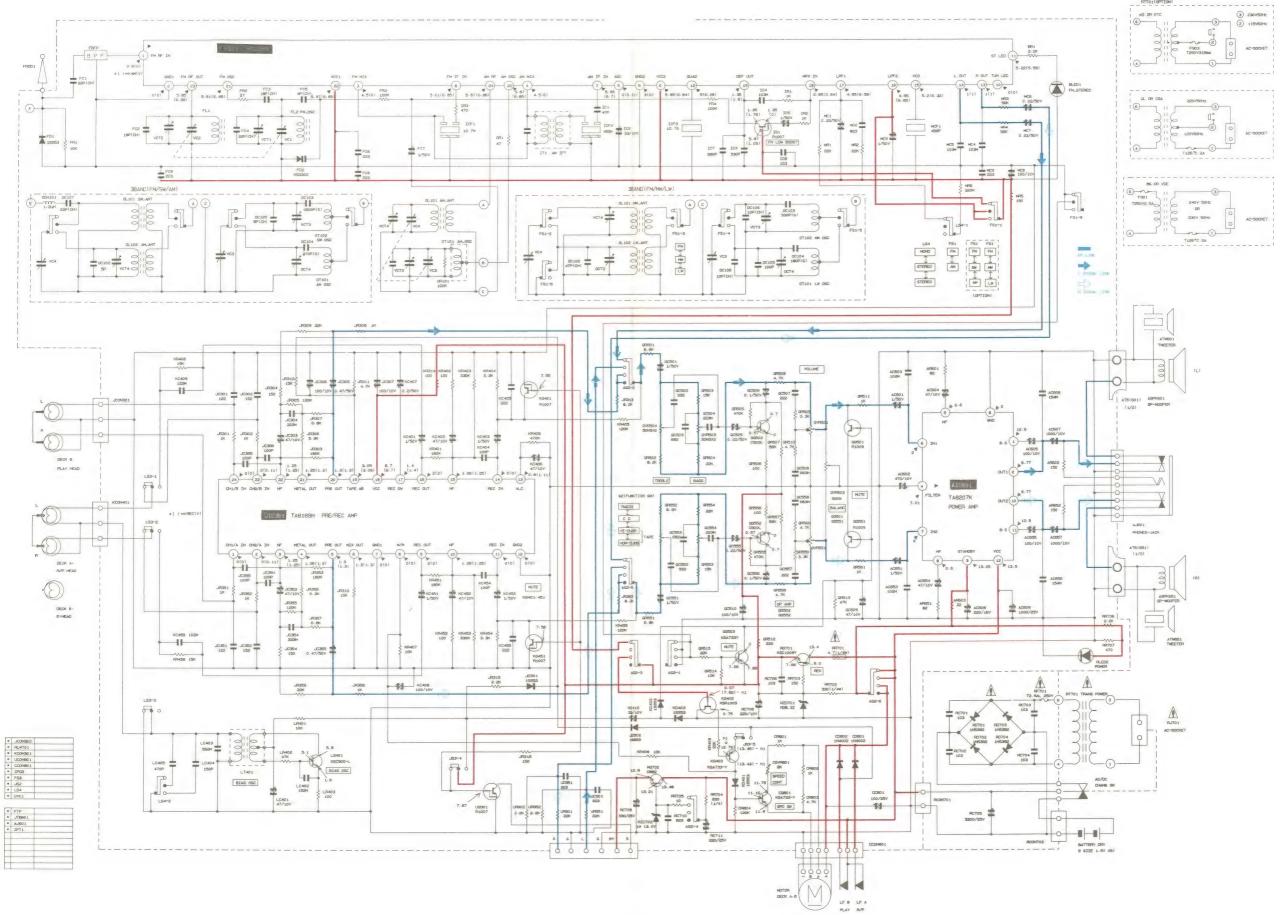
1. RADIO CASSETTE SECTION

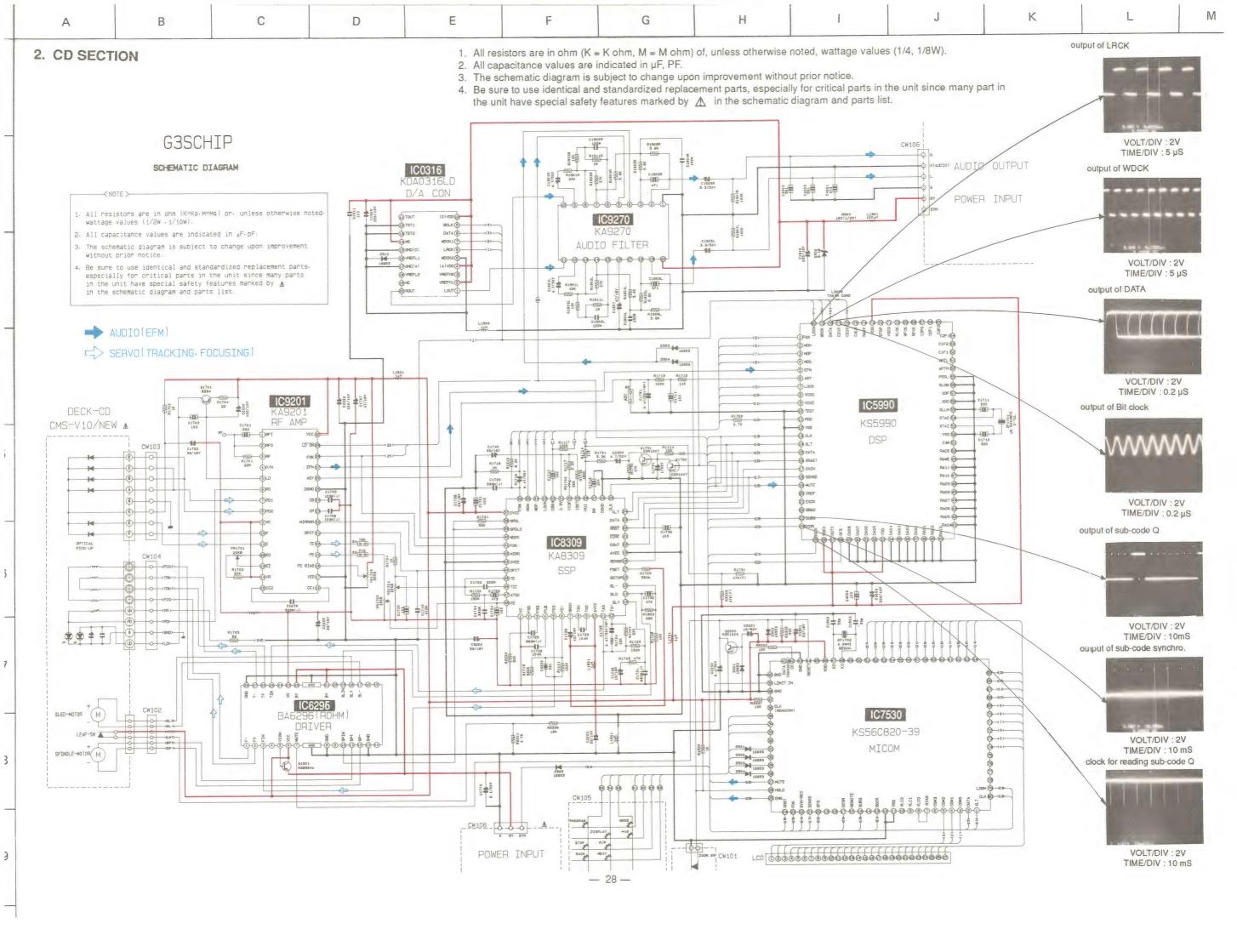


CDP BLOCK-DIAGRAM G3SCHIP CD-PACK ASSY



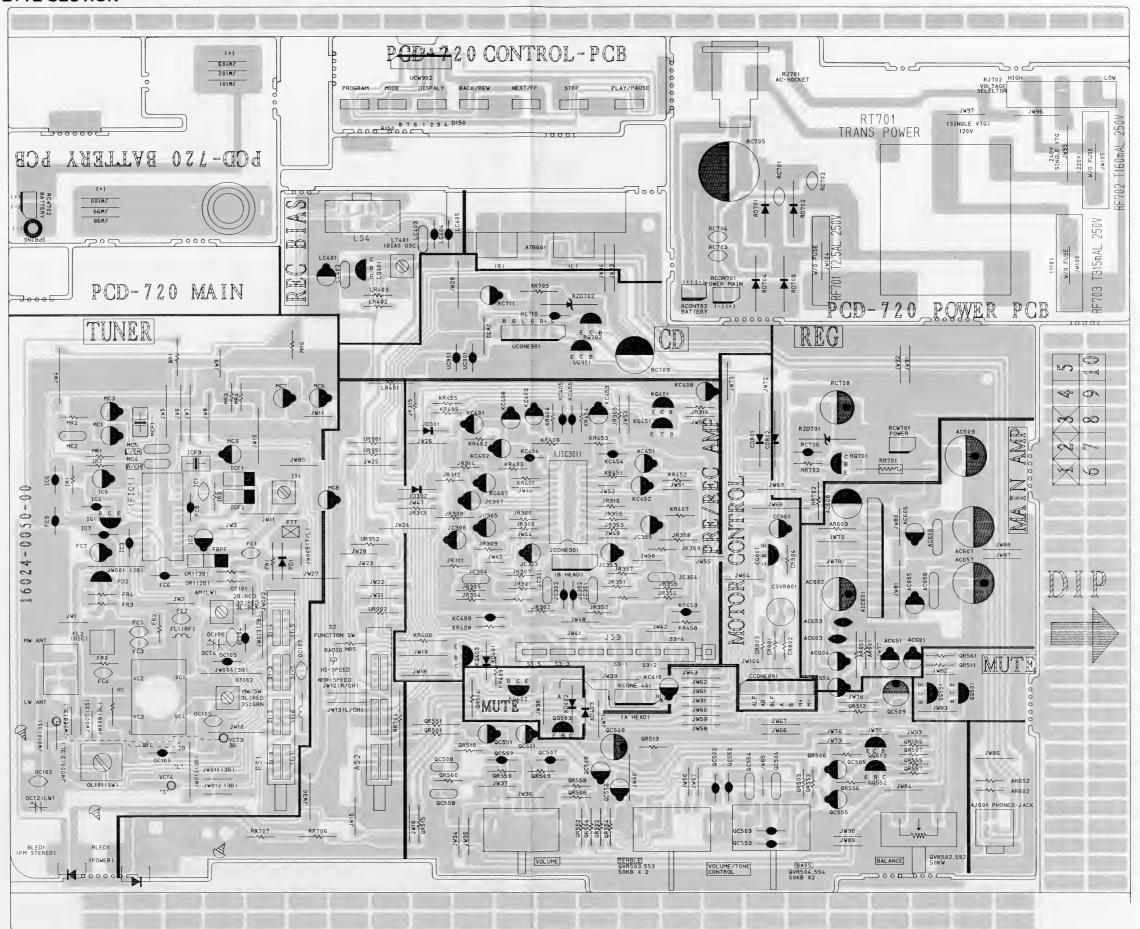
■ SCHEMATIC DIAGRAM

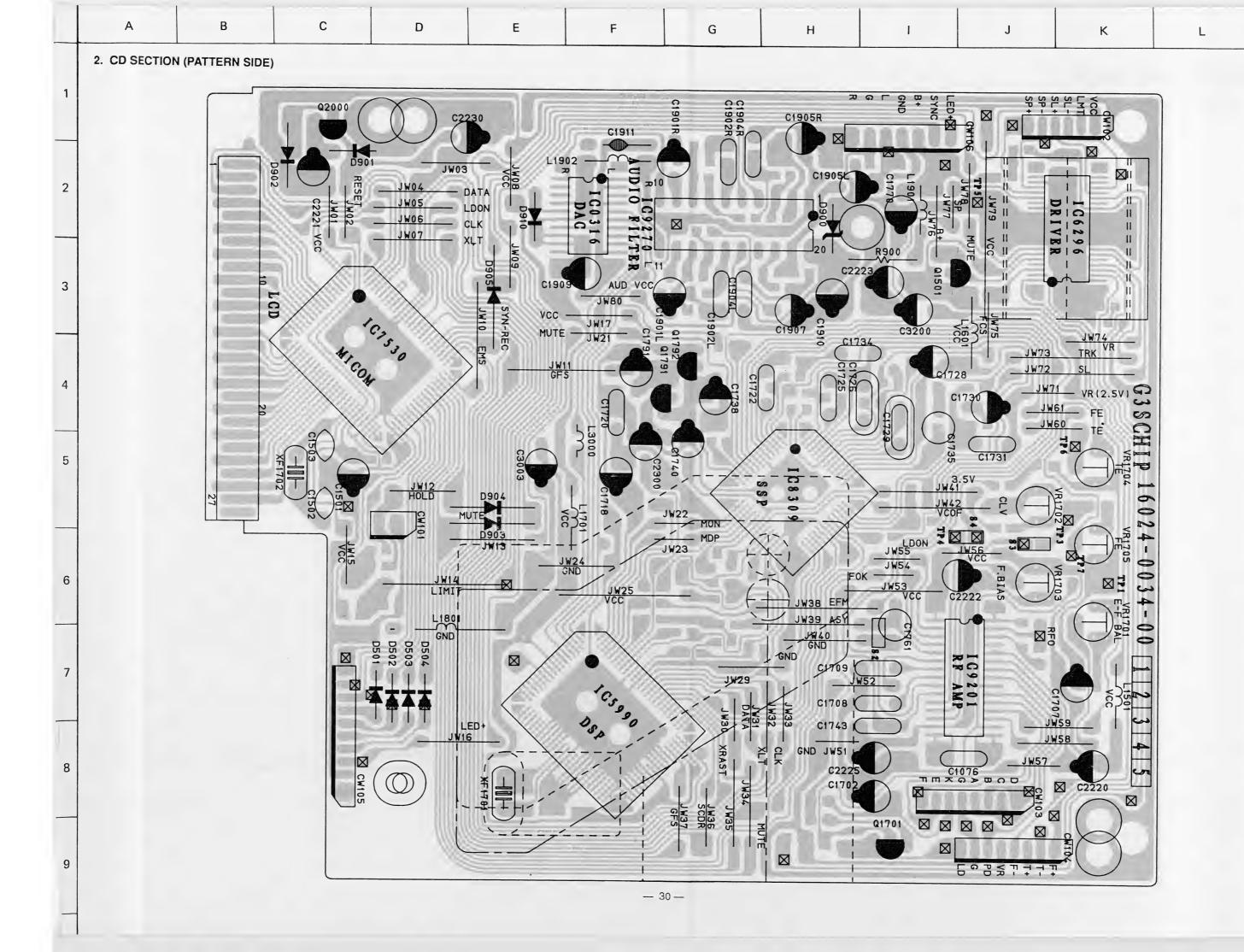




■ PCB PATTERN & MARKING DIAGRAM

1. RADIO CASSETTE SECTION

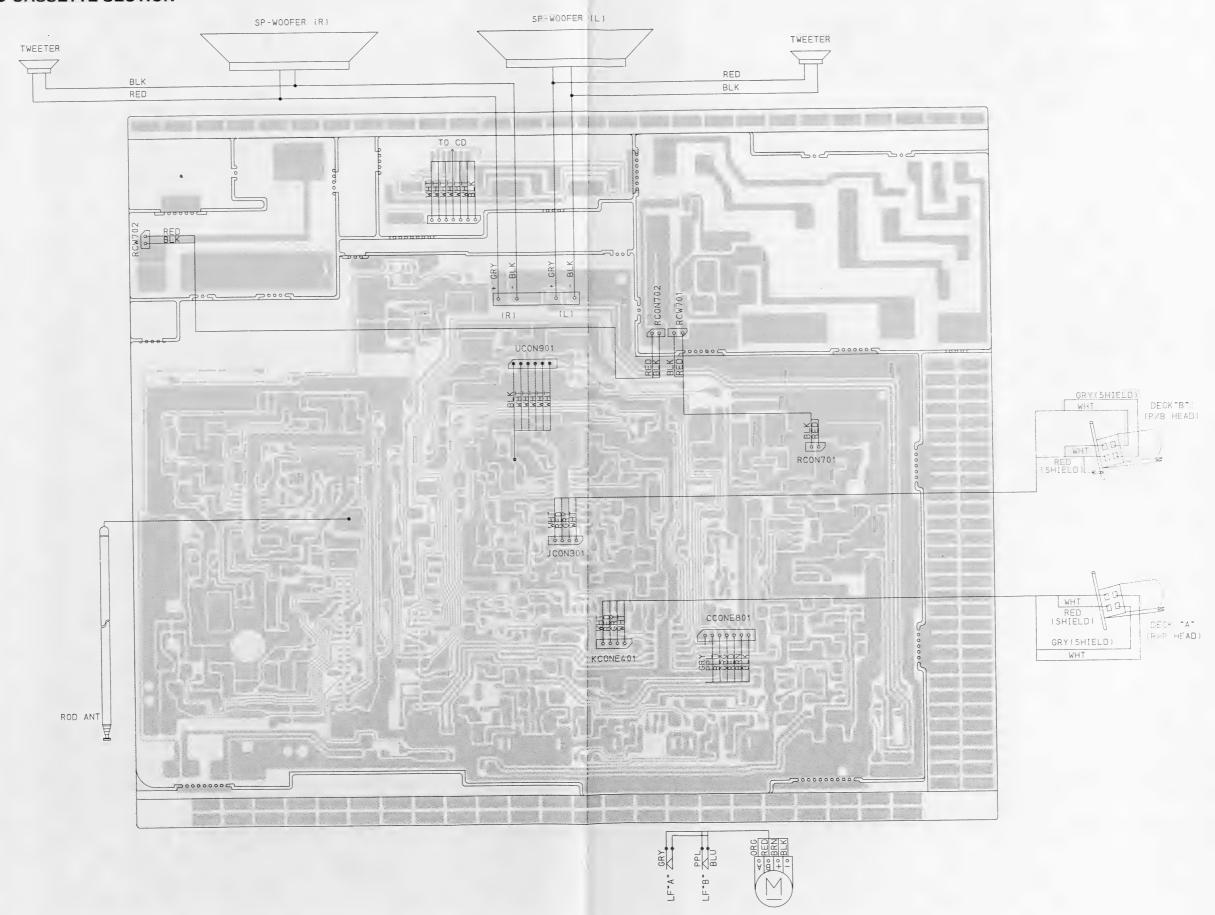


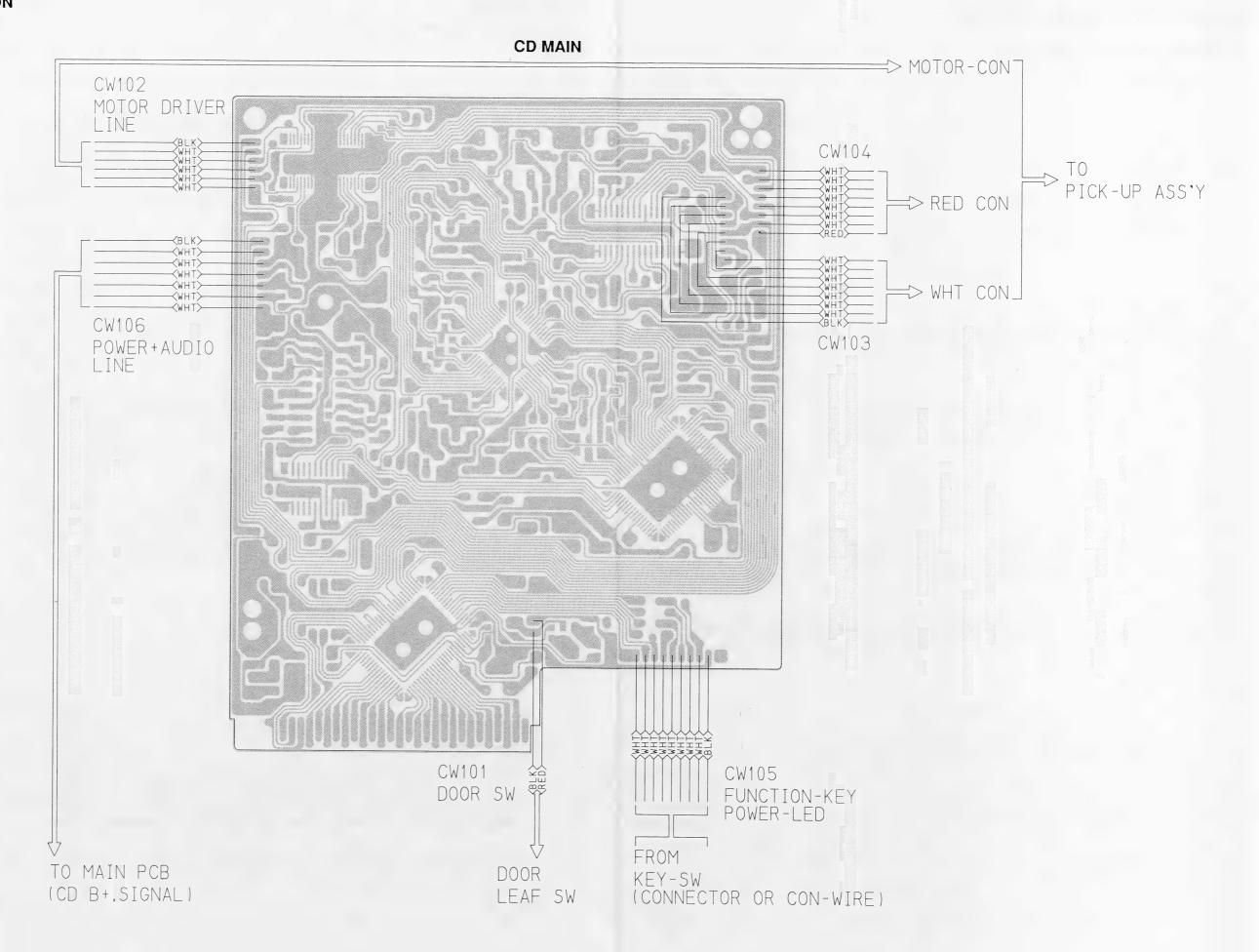


M

WIRING DIAGRAM

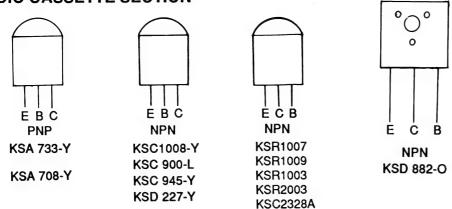
1. RADIO CASSETTE SECTION



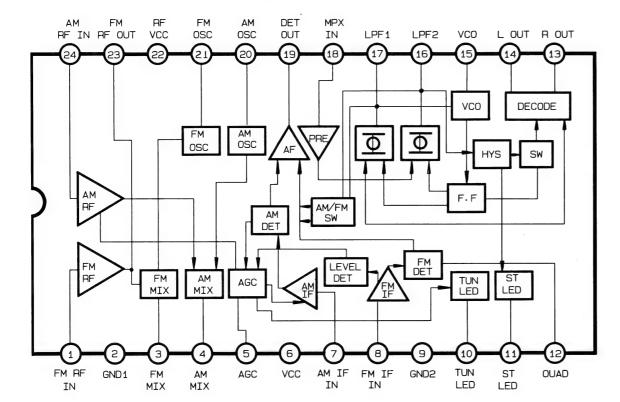


■ IC AND TR LEAD LAY OUT

1. RADIO CASSETTE SECTION



KA2293: IC101 (TUNER)

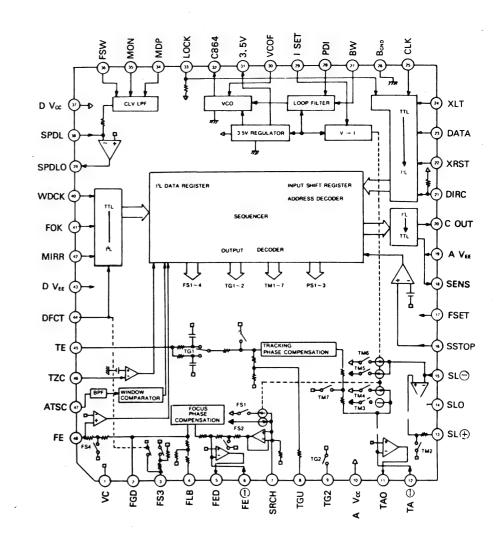


TA8189N: IC301 (PRE/REC AMP) Hetal Pre Tape A VC Roc SM Out SM IS Ch1/8 Ch1/8 Q1 Q1 Q0 Q1 Q0

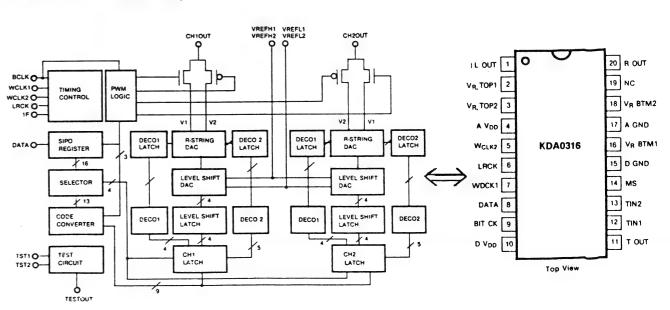
RIPPLE BIAS FILTEN 1N-2 30Ka 20Ka 9 GND

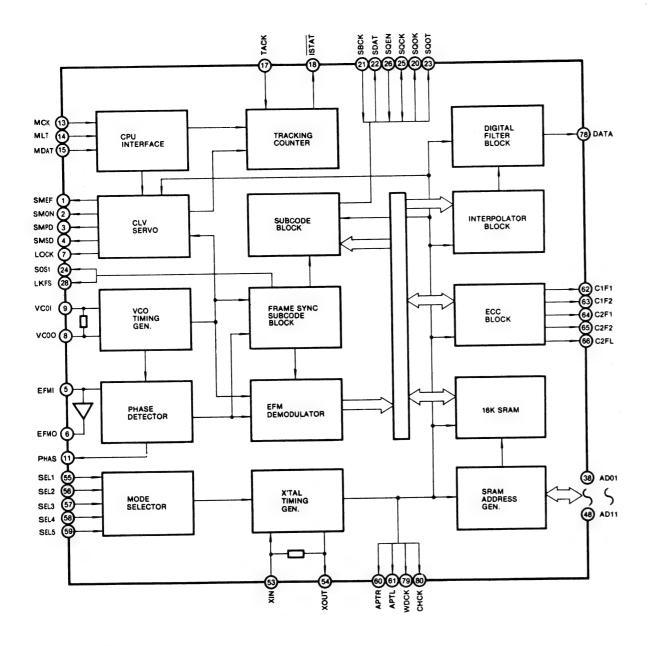
2. CD SECTION

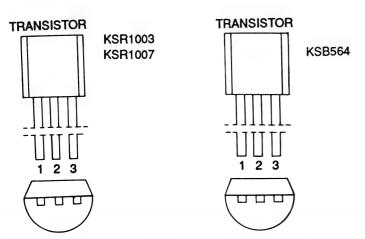
• KA8309 (SERVO SIGNAL PROCESSOR): IC8309



KDA0316LD (D/A CONVERTOR): IC0316

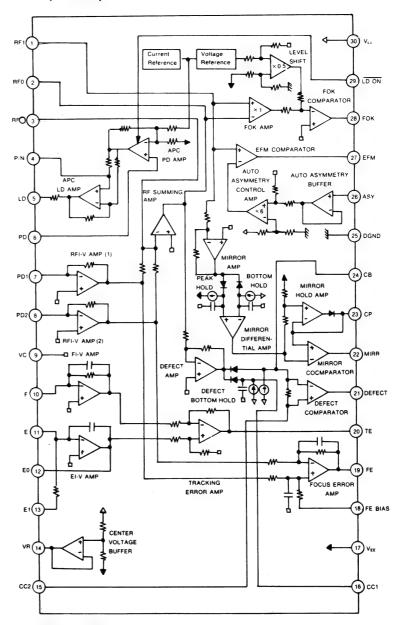




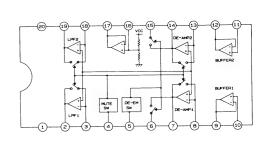


1. EMITTER 2. COLLECTOR 3. BASE 1. EMITTER 2. BASE 3. COLLECTOR

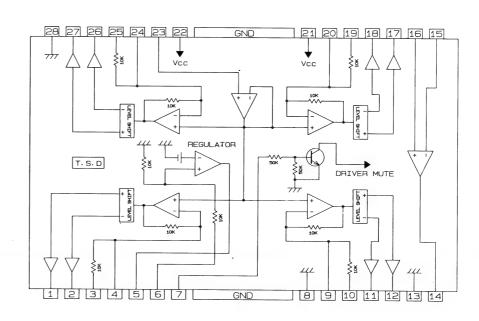
KA9201 (RF AMP): IC9201



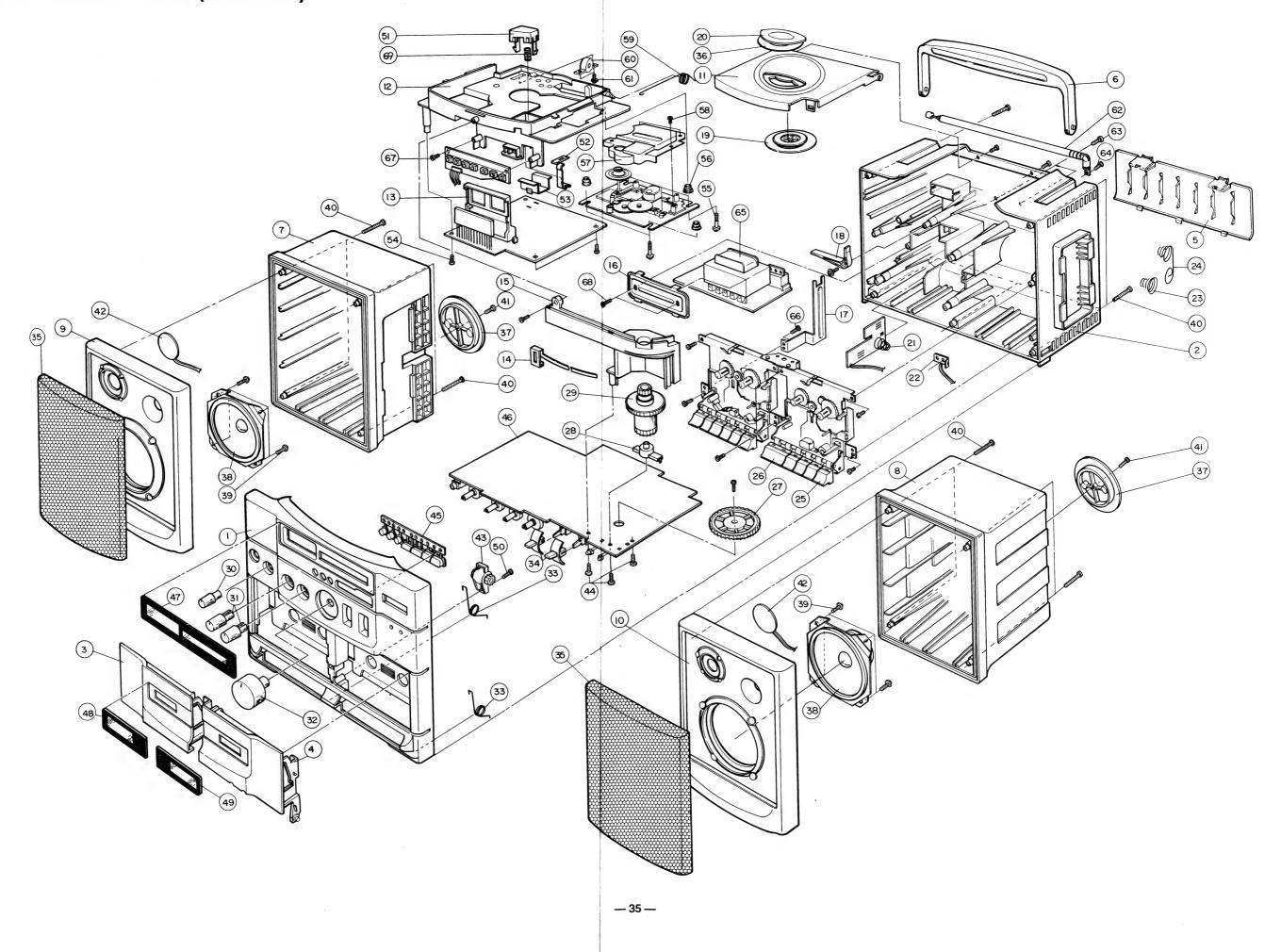
• BA6296FP (IC6296)



• KA9270 : IC9270



■ EXPLODED VIEW (PCD-720)



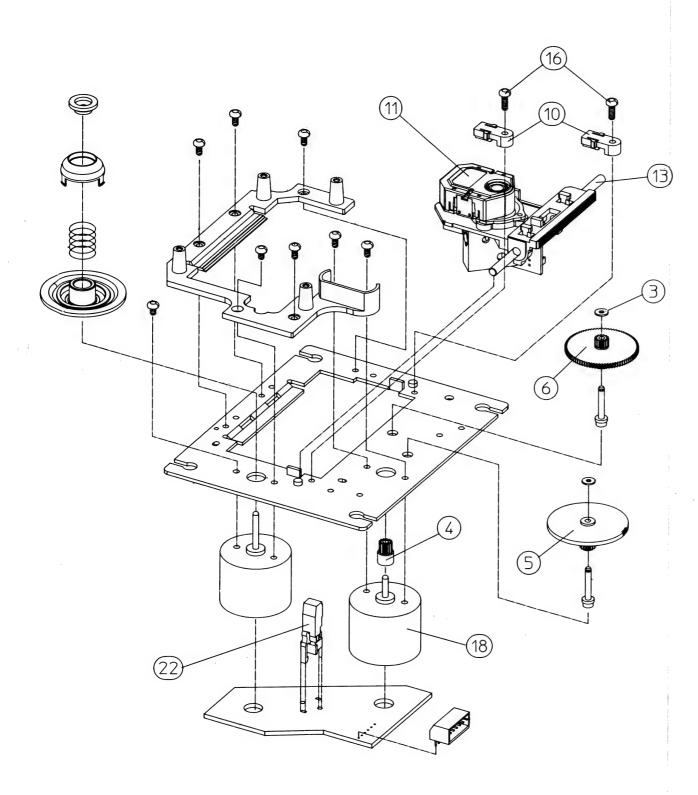
No.	CODE No.	DESCRIPTION	SPECIFICATION	Q'TY	REMARK
1	12001-0041-00	CABINET-FRONT	MIPS	1	* T.ONLY
1	12001-0041-01	CABINET-FRONT	MIPS	1	* L.ONLY
1	12001-0041-02	CABINET-FRONT	MIPS	1	* S.ONLY
2	12000-0044-00	CABINET-BACK	MIPS	1	*
3	14042-0023-00	DOOR-CASSETTE "L"	ABS	. 1	*
4	14042-0022-00	DOOR-CASSETTE "R"	ABS	1	*
5	14103-0007-00	LID-BATTERY	MIPS	1	*
6	14033-0008-00	HANDLE	ABS	1	*
7	12000-0045-00	SPEAKER BACK "L"	MIPS	1	*
8	12000-0046-00	SPEAKER BACK "R"	MIPS	1	*
9	12001-0042-00	SPEAKER FRONT "L"	MIPS	1	*
10	12001-0043-00	SPEAKER FRONT "R"	MIPS	1	*
11	14042-0021-00	DOOR-CD	ABS	1	*
12	12001-0029-00	CHASSIS-CD	ABS	1	*
13	13323-0036-00	HOLDER-LCD	ABS	1	*
14	14164-0006-00	POINTER	ABS	1	*
15	12202-0028-00	CHASSIS-TUNING	ABS	1	*
16	16624-578-600	BRKT-P/T	EGI t1.0	1	
17	13014-0041-00	BRKT-REC	EGI t1.0	1	*
18	11534-0009-00	LEVER-REC	ACETAL	1	*
19		CHUCK ASS'Y		1	
20	14073-0034-00	WINDOW-CD	ACRYL	1	*
21	16674-560-220	SPRING-BATTERY A	PWR	1	
22	16624-513-310	BRKT-ANT	SPTE T0.3	1	
23	16674-531-710	SPRING-BATTERY B	PWR	1	
24	16674-520-810	SPRING-BATTERY A	PWR	1	
25	14083-0114-00	KNOB-DECK	ABS	10	*
26	14083-0115-00	KNOB-DECK "A"	ABS	1	*
27	11514-0004-00	WHEEL-DRUM	ABS	1	*
28	13324-0035-00	HOLDER-KNOB TUNING	ABS	1	*
29	14084-0117-00	KNOB-TUNING	ABS	1	*
30	14084-0109-00	KNOB BALANCE	ABS	1	
31	14084-0112-00	KNOB TREBLE	ABS	2	
32	14084-0111-00	KNOB VOLUME	ABS	1	
33	12724-0043-00	SPRING EJECT DOOR	PWR 1.0	2	
34	14084-0110-00	KNOB LEVER	ABS	2	
35	14002-0012-00	SPEAKER GRILL	SPC t0.6	2	
36	19570-007-710	STICKER W/OA	TOYO AT-2700	1	
37	13323-0037-00	HOLDER SPEAKER	ABS	2	
38	A1300-0024	SPEAKER		2	
39	17048-130-101	SCREW	RH SPEC ; 2S-3x10	8	SPEAKER + SPEAKER FRONT
40	17448-130-201	SCREW	BH; B-3x20	8	SPEAKER + SPEAKER BACK
41	17458-130-121	SCREW	BH; B-3x12	2	SPEAKER BACK + HOLDER SPK
42	14259-500-140	PIAZO + WEETER		2	
43	15214-510-230	DAMPER GEAR (DOUBLE)	CA-W45	1	

No.	CODE No.	DESCRIPTION	SPECIFICATION	Q'TY	REMARK
44	17458-230-101	SCREW	BH; 2S-3x10		MAIN PCB + CHASSUS TUNING
45	14083-0113-00	KNOB CD FUNCTION	ABS	1	*
46	16024-0050-00	MAIN PCB ASS'Y	1VO T1.6 PCD720	1	
47	14073-0035-00	WINDOW FRONT	PC t0.5	1	* T.ONLY
47	14073-0035-02	WINDOW FRONT	PC t0.5	1	* L.ONLY
47	14073-0035-03	WINDOW FRONT	PC t0.5	1	* S.ONLY
48	14074-0044-00	WINDOW CASSETTE 'L"	PC t0.5	1	*
49	14074-0045-00	WINDOW CASSETTE 'R"	PC t0.5	1	*
50	17458-130-121	SCREW	BH 3x12	1	DAMPER + CABINET FRONT
51	14083-0116-00	KNOB CD EJECT	ABS	1	*
52	11534-0008-00	LEVER EJECT	ACETAL	1	*
53	11124-0013-00	HEAT-SINK	ALS t2.0		
54	17458-230-101	SCREW	BH; 2S-3x10		CA PCB + CD CHASSIS
55	15104-531-720	SHAFT-CD	FE FZW 2.6x11.5	4	
56	16174-503-410	RUBBER CD	SILICON	4	
57	16854-524-310	CAP PICK UP	ABS 06601		
58	17158-120-052	SCREW TAP	BH2 x 6		CAP PICK UP + MECHA
59	12724-0044-00	SPRING DWR CD	PWR 1.0	1	*
60	15214-506-011	DAMPER GEAR	POM	1	
61	171558-230-101	SCREW BH SPEC	2S-3x10	2	DAMPER + CHASSIS-CD
62	14509-316-100	ANTENNA	KDP-0024-A-0	1	
63	17118-530-123	SCREW BH		4	MAIN PCB + CABINET BACK
64	17048-130-101	SCREW		1	ANTENNA + CABINET BACK
65	12869	TRANS-POWER	57x28mm	1	
66	17098-120-045	SCREW		1	BRKT REC + CASSETTE DECK
67	17458-230-101	SCREW TAP	BH 3x10	1	CD CONTROL PCB + CA CHASSIS
68	17558-230-101	SCREW TAP SPEC	BH 2S-3x10	2	BRKT P/T + CABINET BACK
69	12724-0045-00	SPRING-LEVER EJECT	SUS 0.3	2	*
75	12869-225-400	TRANS-POWER		1	
76	12869-225-410	TRANS-POWER		1	
77	12869-225-420	TRANS-POWER		1	

NOTE: Code number of the item marked a star (*) may be different.

■ EXPLODED VIEW

1. CD DECK (CMS-V10)



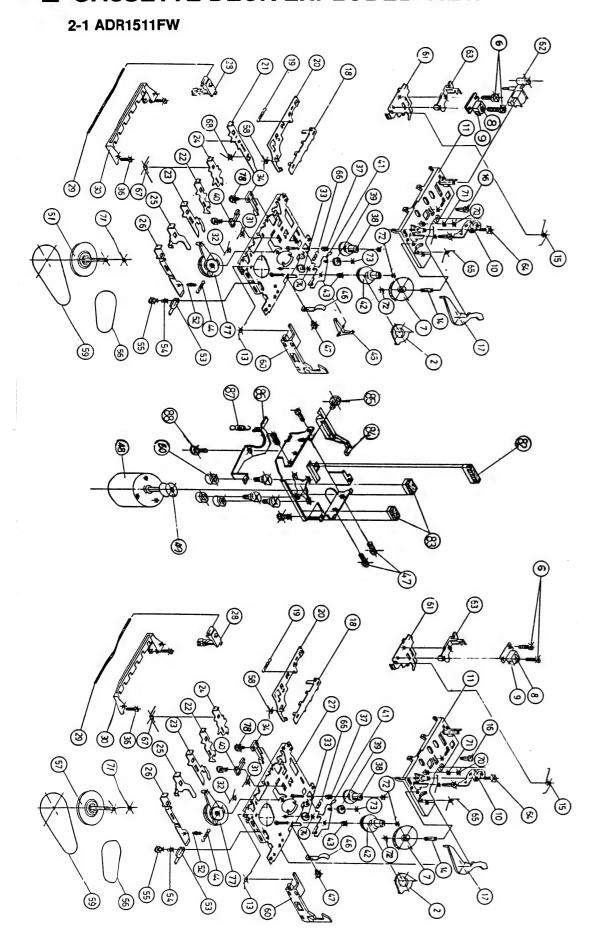
DECK ASS'Y: CMS-V10 (14929-407-010)

NO.	CODE NO.	DESCRIPTION & SPECIFICATION	Q'TY
4	15214-510-510	GEAR-P/U (A) ; P.O.M (DURACON KT-20)	1
5	15214-510-610	GEAR-P/U (B); NYLON 12	1
6	15214-510-710	GEAR-P/U (C) ; P.O.M (DURACON KT-20)	1
10	16033-505-210	HOLDER-SHAFT ; ABS 94HB	2
11	14239-101-610	PICK UP ; OPTICAL HEAD SOH 90T4	1
13	15104-503-410	SHAFT-P/U ; SUS 420J2 Ø3	1
16	17008-120-063	SCREW-PH;+M2 x 6 FE FZB	2
18	14769-057-250	MOTOR-FEED ; RF-310T (SHAFT 10.9)	1
22	13564-601-100	LEAF-SW.; MSW-1731CVC	1

^{*} Parts which are not described in the CD DECK list are not serviceable.

If you need any other parts except those described, apply CD DECK ass'y.

■ CASSETTE DECK EXPLODED VIEW



■ CASSETTE DECK PARTS LIST

* DECK ASS'Y : ADR1511FW(17159-0027-00)

No.	CODE No.	DESCRIPTION	SPECIFICATION	Q'TY
2	10000-607-102	SENSOR REEL	1153-00080AA	2
5	10000-542-002	E-HEAD	PHK380 MS16A	1
7	10000-607-107	GEAR CAM	11128-0391AA	2
9	10000-523-008	RP HEAD	MS 15R-AA2N1	2
10	10000-607-110	ASS'Y PINCH ARM	ADR15-006	2
17	10000-607-117	ARM SENSOR	11102-00530AA	2
28	10000-607-128	KEY KNOB	11133-00010AA	12
33	10000-607-133	GEAR FF	11128-00080AA	2
34	10000-607-134	SW LEAF (MAIN)	MSW2526GNBKCV	2
38	10000-607-138	REEL S ASS'Y	ADR15-001	2
39	10000-607139	GEAR ROLLER-T	11128-00050AA	2
42	10000-607-142	REEL T ASS'Y	ADR15-002	2
45	10000-607-145	LEVER REC SAFETY	11134-01000AA	1
46	10000-607-146	SP PACK	51299-02506XC	2
48	10000-502-020	MOTOR	EG530 YD2B	1
49	10000-607-149	PULLEY Y MOTOR	11145-00450AA	1
51	10000-607-151	FLY WHEEL ASS'Y-S	ADR15-003	1
53	10000-607-153	CAM PAUSE LOCK	11116-00010AA	2
55	10000-607-155	CAP	11117-00020AA	2
56	10000-607-156	BELT SUB	34.7ø x 1.0t	2
57	10000-607-157	FLY WHEEL ASS'Y-D	ADR15-004	. 1
59	10000-607-159	BELT MAIN	59.7Ø x 1.0t	2
60	10000-607-160	LEVER EJECT (F)	11134-01220AA	2
62	10000-607-162	ARM MAGNETIC	11102-00520AA	1
63	10000-607-163	BASE HEAD-M	11105-00030AA	2
65	10000-607-165	SP PAUSE SAFETY	51263-02026	2
77	10000-607-177	ARM F.R ASS'Y	ADR15-005	2
84	10000-607-184	LEVER RELEASE	11134-01240AA	1
86	10000-607-186	LEVER SYNCRO	11134- 01280AA	1

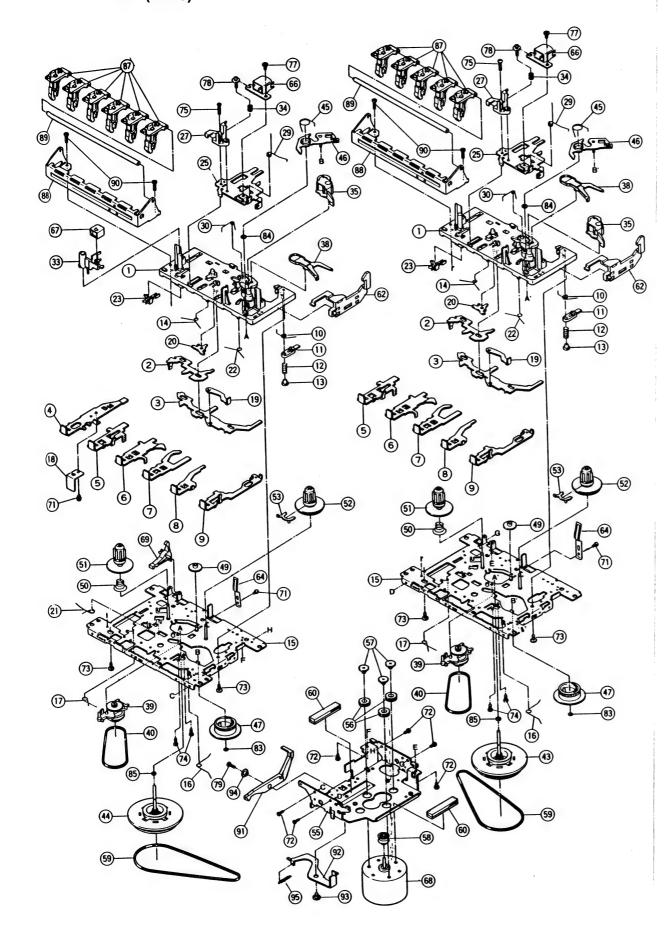
NOTE: Parts which are not described in the DECK list are not serviceable.

If you need any other parts except those described, apply DECK ASS'Y (Only DECK ASS'Y is available).

The mechanical parts with no reference number in the above chart, though marked in the Exploded View, are not supplied. Except for the parts indicated in the above list, you should order in an Assembly form.

-38 -

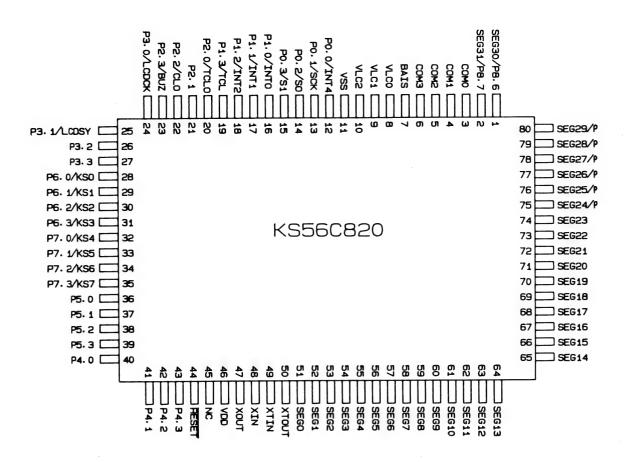
2-2. TN21ZSW-1197 (SB10)



* DECK ASS'Y: TN 21ZSW-1197(SB10) 17159--0026-00

No.	CODE No.	DESCRIPTION	SPECIFICATION	Q'TY	REMARK
11	10000-268-011	PAUSE LEVER	1921-14-55	2	
13	10000-268-013	PAUSE STOPPER	1921-14-11	2	
23	10000-268-023	LEAF SWITCH	MSW1541T	2	
33	10000-268-033	MG ARM	1921-03-05	1	
35	10000-268-035	PINCH ROLLER ARM ASS'Y	1921-04-309	2	
38	10000-268-038	SENSING LEVER	1921-26-04A	2	
39	10000-268-039	RF CLUTCH ASS'Y	1921-07-302	2	
40	10000-268-040	RF BELT	1921-07-03	2	
43	10000-268-043	FLYWHEEL ASS'Y	1921-09-304	1	·
44	10000-268-044	FLYWHEEL ASS'Y	1921-09-303	1	
47	10000-268-047	CAM GEAR	1921-26-02	2	
49	10000-268-049	FF GEAR	1821-10-70	2	
51	10000-268-051	SUPPLY REEL ASS'Y	1921-05-304	2	
52	10000-268-052	TAKE UP REEL ASS'Y	1921-05-303	2	
53	10000-268-053	SENSER	1921-05-60	2	
58	10000-268-058	MOTOR PULLEY	1921-12-13	1	
59	10000-268-059	MAIN BELT	1821-12-22	2	
62	10000-268-062	EJECT SLIDE LEVER	1921-13-02	2	
64	10000-268-064	PACK SPRING	1821-10-93	2	
66	10000-523-008	R/P HEAD	MS15RAA2N1	2	
67	10000-542-002	E HEAD	PHK380-MSI6A	1	
68	10000-502-020	MOTOR	EG530YD2B	1	
69	10000-268-069	RECORD SAFETY LEVER	1821-10-69	1	
87	10000-268-087	OPERATION LEVER	1821-31-07	12	
91	10000-268-091	P KICK LEVER (B)	1821-12-09	1	
92	10000-268-092	P KICK LEVER (A)	1821-12-68	1	

The mechanical parts with no reference number in the above chart, though marked in the Exploded View, are not supplied. Except for the parts indicated in the above list, you should order in an Assembly unit.



Pin Name	Pin Description				
P1.0-P1.3	4-bit Input	Internal pull-up resistor car			
P2, P7	4-bit Input/Output	be specified in 4-bit unit			
P3, P6	I/O mode selectable in 1-bit unit by softwarde	by solftware			
P4, P5	4-bit input/output, N-ch open drain				
P8.0-P8.7	Outputs in 1-bit unit (shared with segment output	s)			
SEG0-SEG23	Segment output for LCD display				
SEG24-SEG31	Segment output for LCD display (shared with Por	t 8)			
сомо-сомз	Common signal output for LCD display				
VLC0-VLC2	LCD power supply pin				
BIAS	LCD power supply control pin for 3/5V operating				
LCDCK	LCD clock output for display expansion				
LCDSY	LCD sync. clock output for display expansion				
TCL	Timer/Counter external clock input				
TCLO	Timer/Counter clock output				
INTO, 1, 2, 4	External interrupt input				
CLO	Clock output				
BUZ	2KHz clock output for buzzer				
KS0-KS7	Semi-interrupt input detecting external falling edg	je			
SCK, SI, SO	SCK: serial clock, SI: serial input, SO: serial outp	out			
XIN, XOUT	Crystal/Ceramic or RC clock I/O for Main-system	clock			
XTin1 XTout					

■ CD PACK PARTS LIST

 \triangle indicates parts for circuit safe guarding purpose. Therefore, when replacing, be sure to use specified parts only.

LOCATION NO.	CODE NO.	DESCRIPTION & SPECIFICATION	NEW	REMARK
IC0316	12109-303-150	IC-DAC ; KDA0316LD (BULK)		
IC5990	12119-203-770	IC-DS PROCESSOR ; KS5990/KS59910	*	
IC8309	12119-203-780	IC-SS PROCESSOR ; KA8309	*	
IC6296	B4012-0073	IC-LINEAR ; BA6296FP		
IC9201	12119-203-790	IC-RF AMP ; KA9201	*	
IC9270	A4012-0064	IC-AUDIO FILTER ; KA9270	*	
IC7530	12109-303-690	IC-MICOM; KS56C820-06	*	
Q1701, Q1501	12149-202-050	TRANSISTOR ; KSB564A-Y		
Q2000	12159-301-780	TR-DIGITAL ; KSR1003		
Q1791, 1792	12159-301-800	TR-DIGITAL ; KSR1007		•
	12169-301-290	DIODE-SW ; 1SS53/1N4148 CT : 6PF		
	12169-301-290	DIODE-SW ; 1SS53/1N4148 CT : 6PF		
,	12429-411-109	DOIL-CHOKE ; BAL03ST1ROM		
L1901	12429-411-101	COIL-CHOKE ; LAL02TB 101K, 100UH		
XF1702	14534-504-040	CERAMIC-RESONATOR ; CSA 4.00MG		
XF1701	14539-401-050	X-TAL ; HC18U 16.9344MHz		
VR1701, 1704, 1705	11249-102-044	VR-SEMI TAPE-H ; DVN-DJA A03B24 (20K)		
VR1703	11249-102-064	VR-SEMI TAPE-H ; DVN-DJA A03B24 (50K)		
VR1702	11249-102-104	VR-SEMI TAPE-H ; DVN-DJA A03B23 (2K)		
LCD	12339-104-690	LCD-CD; LE0636AP		

ELECTRICAL PARTS

1. RADIO CASSETTE SECTION

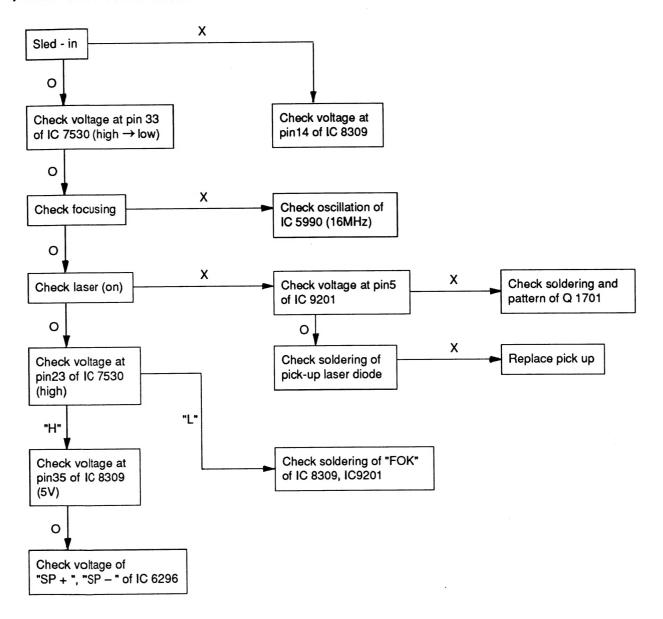
LOCATION NO	CODE NO	DESCRIPTION NO	SPECIFICATION	Q'TY	NEW	REMARK
FIC1	A4012-0072	IC-TUNER	KA2293	1		
	12109-401-840		TA8189N	1		
	12119-101-290		TA8207K	1		
1	12149-401-900		KSD882-Y	1		
			KSA733-Y	3		
	12149-101-520	IKANSISIUK	K98/99-1	J		
CQ801			"001000 V			
	12149-301-930		KSC1008-Y	1		
QQ501, 551,	12159-301-790	TR-DIGITAL	KSR1009	3		
KQ402						
IQ1, UQ901,	12159-301-800	TR-DIGITAL	KSR1007/108M	4		
KQ401, 451				-		
	12149-301-840	TRANSISTOR	KSC900-L	3		
QQ502, 552	12140 001 040	1 KANOTOTOK	nococo L			
WW302, 332						
annot con	10100 001 000	DIODE_DECM	1N4002	0		
	12169-201-090			2		
	12169-403-290	DIODE-2M	1N4148/1SS53	0		
JD302, KD401						
KD402, 403						
	12169-403-600	DIODE-ZN	UZP-8. 2B	1		
	12169-403-740	DIODE-ZN	UZP 13B 12.4-14.1	1		
	12169-501-160		KS3302/	1		
	12169-201-140		1N5392 TAPING	4		
	12109 201 140	DIODE RECT	INDOOR IN INC	•		
703, 704	10000 001 450	TED	CI DOAUD (DED)	2		
RTED1, KTED1	12309-001-450	LED	SLR34VR(RED)	4		
					1	
	14529-403-010		PFW-B4	1		
ICF1	14529-301-420		SFE10.7MA5L-A	1		
ICF2	14529-315-010	CERAMIC-FILTER	SFU455B	1		
	14529-302-920	FILTER-DISCRIMI	CDA10. 7MG16-A	1		
		CERAMIC-RESONATOR		1		
	12619-058-603		290 uH	1		2BAND
	12619-173-126		2.13NH AQ FSW GREEN	1		3BAND(OPTION)
			740NH AQ FLW BLACK	1		3BAND(OPTION)
	12619-176-011			1		
0T102	12169-050-703		120 uH	1		3BAND(OPTION)
LT401	12619-012-811	COIL-SEVEN CAN	1R65HH I-BIAS	1		
FL1	12609-133-420	COIL-H, SPRING	4T RBP 4R5D CW CLS	1	1	
FL2	12450-315-311	COIL-FM OSC	0.5PI 0.1UH 1.7/8T	1		
OCH101	12429-070-350		AX1, 2UH-03(LAL03AN1R2M)	1		3BAND(OPTION)
0L101	12509-805-020		9.5 M/M	1		3BAND(OPTION)
0L101, 102			285UH/3.5MHAR8X100MW/LW	. –		3BAND(OPTION)
		COIL-AM ANT ASS'Y		1		2BAND
0L101				1		3BAND(OPTION)
0L102	12510-232-566	COIL-AM ANT ASS'Y	750 UN	1		OPITION)
	14040 000 ====	WARTON DOLL	DOS CODOS TO			ODAND
FVC	11819-309-510	N .	P2S-22BGLT	1		2BAND
FVC	11819-309-380	VARICON-POLY	P2S-22BPT A/C-H	1		3BAND(OPTION)
QVR501	11209-804-020	VR-DOUBLE	RK16K12E0 Z01 53B	1		
QVR502	11209-805-010	VR-ROUND, SIG	RK16K1150 002 53W	1		
QVR503'504	11219-142-150		RK16K12AO ZO4 53B	2		
CSVR801	11249-102-104		TAPE-H ; A03 B23 (2KQ)		1	
100.11001		1				
AJ601	13339-101-502	JACK-HEADPHONE	SHQ9085-01-142(GRN)	1		
ATB601			LTL0490-0001R	1		
10001	10004 000 910	TERMINAL OF PURPH	12.10.100 0001K			

LOCATION NO	CODE NO	DESCRIPTION NO	SPECIFICATION	Q'TY	NEW	REMARK
FS1 FS1 AS2 JS3 LS4 US901, 902, 903, 904 905, 906 907	13549-801-210 13549-801-310 A3014-0031 A3008-0001 13519-930-360 13559-910-100	SWITCH-LEVER SWITCH-LEVER SWITCH-SLIDE SWITCH-SLIDE	00221013S 2C-2P T0083002 8C-3P 6C4P 20.5MT ASH HTW7238 6C-2P ASH 00620452T 00230673 2C-3P SKHV10910L01	1 1 1 1 1 7	*	2BAND 3BAND(OPTION)
KCON401	13349-512-550 13349-512-561	CONNECTOR-WAFER CONNECTOR-WAFER CONNECTOR-WAFER CONNECTOR-WAFER	STICK 5267-04A 4P-TYPE STICK 5045-04A 4P-TYPE STICK 5267-02A 2P-TYPE STICK 5267-07A 7P-TYPE	1 1 2 2		
CCW801	13029-448-130 13078-472-115 13078-172-215 13029-477-230	CONNECTOR-WIRE/B, CONNECTOR-WIRE	5264-01 1533#28 300M/M 5102-04 1533#28 300M/M 5264-02/5395-02 150M/M 5102-02/5395-02 150M/M 5264-07 1007#26 300 5264-07/5264-07 250M/M	1 1 1 1 1		
RR701 RT701 RT701 RT701	11058-277-479 12869-225-430 12869-225-420 12869-225-410	TRANS-POWER TRANS-POWER	RF 1/4T 4.7-J EI57X28 115 / 230V EI57X28 120 / 220V EI57X28 230 / 240V	1 1 1	*	OPTION A OPTION A OPTION A
RJ701 RJ701 RJ701	13354-501-310 13354-501-320 B3043-0005	SOCKET-2P, SW (CP)	HSC1463-01-0101(PIN) HSC1466-01-0101(PIN) HSC1563 (UL/CSA)	1 1 1		OPTION A OPTION A OPTION A
RF701 RF701 RF701	B3065-0082 14709-441-262 14709-241-110		TL250V 2.5A UL/CSA GMC T250V 2.5A 20 EUR T250V 315mA 20 EUR	1 1 1		OPTION A OPTION A OPTION A

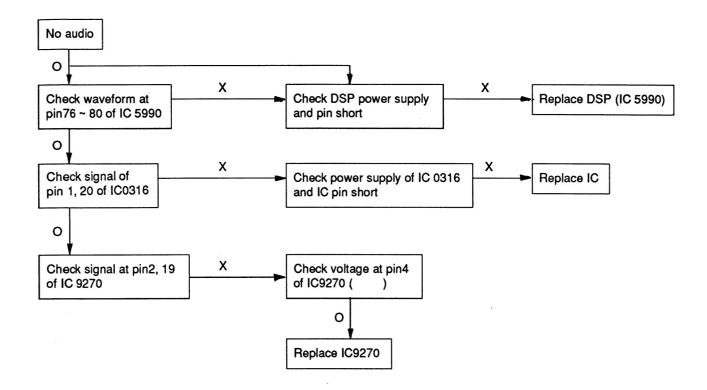
^{* \(\}frac{\Lambda}{\text{ indicates parts for circuit safe guarding purposes.}}\)
Therefore, when replacing, be sure to use specified parts only.

■ TROUBLE SHOOTING (CD)

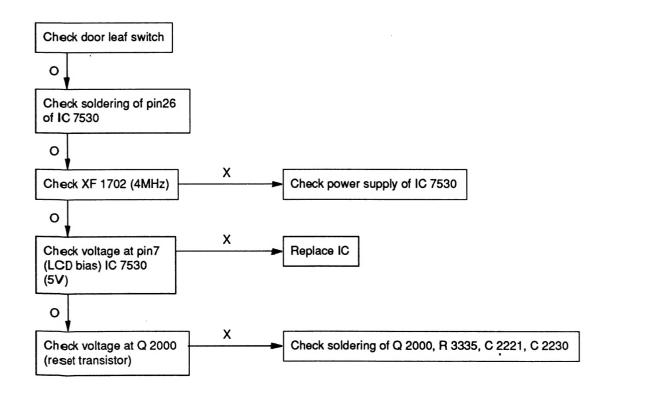
4) DISC NOT ROTATING



2) NO AUDIO



3) DISPLAY NOT WORKING



ABBREVIATION LIST

AC **Alternating Current ADJustment** ADJ **AFC Automatic Frequency Control** Automatic Level Control ALC **Amplitude Modulation** AM **AMP AMPlifier ANTenna** ANT **ASSemblY ASSY** Base **Bold Head** BH **BLacK BLK** BLU **BLUe Band Pass Filter BPF** BRN **BRowN BRacKeT BRKT**

Collector, Capacitor Compact Disc ČD CF Ceramic Filter Ch Channel

centimeter cm Cross Interleave Reed solomon Code CIRC

Constant Linear Velocity CLV

COL **COLon** COM **COMmon CONnector** CON

Depth

D/A Digital to Analog Digital to Analog Conveter DAC

dΒ deciBel DC **Direct Current** DETector DET **DEViation** DEV DIVision DIV

Digital Signal Processor **DSP**

Ē.F

Eight to Fourteen E-HEAD Erase HEAD EQ **EQualizer**

F.Bias Focus Bias Focus Error F.E Fast Forward FF F.FWD Fast ForWarD

Figure

Fig FM Frequency Modulation

FOK Focus OK **FREQ FREQuency**

GND GrouND

Height, High Hz Hertz

Integrated Circuit IC IF

Intermediate Frequency
Intermediate Frequency Transformer IFT

1/0 Input/Output INTRO **INTROduction**

KHz KilloHertz Kg Kilogram

Left, Low

LCD Liquid Crystal Display **LED** Light Emitting Diode LPF Low Pass Filter LSI Large Scale Integration

LW Long Wave MHz MegaHertz MICOM MICro COMputer

MIN **MINute** MIXer MIX millimeter mm **MODulation** MOD MultiPleX MPX mili Voltage m۷ Medium Wave MW milli Watt mW

Ν Negative

Negative FeedBack NFB

nano meter nm

ORG ORanGe osc **OSCillator**

Point, Positive PB **PlayBack**

Printed Circuit Board PCB PF Pico Farad

P/T **Power Transformer**

P/U Pick Up

Q'TY QuantiTY

Right, Resistor

RAM Random Access Memory

REC RECord REGulator REG **REW REWind**

RF Radio Frequency Round Head RH Read Only Memory ROM Record/Play

R/P

revolutions per minute rpm

second Sec **SELector** SEL SPK **SPeaKer**

SSG Standard Signal Generator Servo Signal Processor SSP

STereo ST

SVR Semi Variable Resistor SW SWitch, Short Wave SYNC **SYNChronous**

T.E Tracking Error Test Point TP TR **TRansistor TRANS TRANSformer**

VCO Voltage Controlled Oscillator

Voltage peak to peak Vpp VR Variable Resistor **VREF** REFerence Voltage V/SEL Voltage SELector Vacuum Tube Volt Meter **VTVM**

Watt, Weight WHT WHiTe

X-TAL crystal